Reference and Guide Book

THE TRENT CANAL

The Department of Railways and Canals of Canada

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TRENT CANAL

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1911

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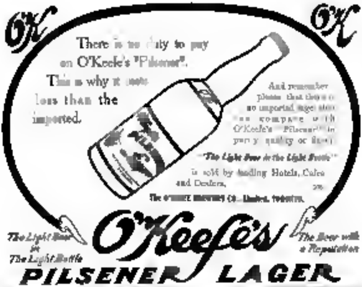
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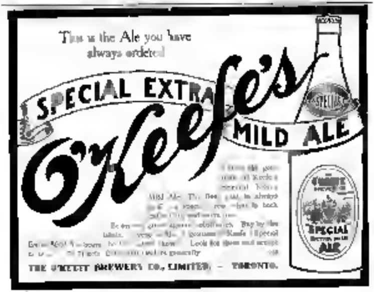
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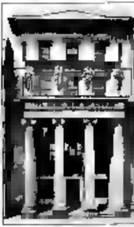

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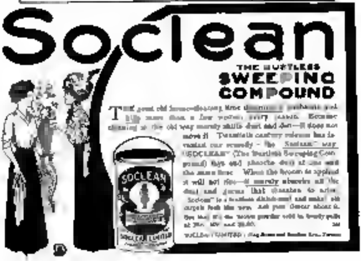

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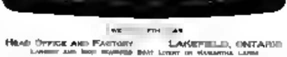

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1911 EDITION

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[illegible]
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INTRODUCTION

DURING the past few years there have been a great many requests for detailed information regarding the Trent Canal. This has especially been the case since the completion of what is known as the Lake Simcoe-Balsam Lake Division, throwing open, as it did, an uninterrupted stretch of navigation of 160 miles, extending from Orillia on Lake Simcoe to Healey's Falls on the Trent River. The increasing popularity of the various lakes and rivers that constitute the Trent Canal as tourist and summer-resident resorts, the added growth in the number of private yachts, steamboat business has increased to large proportions, and we now have practically a through steamboat service from the Trent River to points on Lake Simcoe. With this increase in the number of yachts and steamboats has come an increased demand for charts of the navigable channel, and for information regarding the Canal generally. It is, therefore, with a view of satisfying the desire for enlarged knowledge in these respects that this book is compiled. I have endeavored to present herein, in as complete and condensed a manner as circumstances will permit, charts of the various lakes, which will prove useful to navigators; facts concerning the early history of the Canal, and more or less comprehensive details generally concerning the position the Canal occupies at the present time, and is destined to occupy in the scheme of Canadian transportation.

I regret that at the time of the publication of this work no official charts were available in the Railways and Canals department, defining the navigation channels of the greater portion of the lakes and rivers that constitute the Trent Canal. The charts presented herein, while unofficial, are for the most part based upon the observation and experience of practical navigators, and will be found sufficiently reliable to permit of navigation with reasonable ease and safety the 160 miles of Canal and connecting waters, between Orillia and Healey's Falls. The chart of Lake Simcoe, however, which is herein published, is absolutely authentic, and should be found invaluable to vessel owners on Lake Simcoe.

J. S. CLARRY

MADE THE FIRST TRIP

THAT the route of the Trent Canal via the Severn and Trent Rivers, was a recognized channel of water communication between Lake Huron and Lake Ontario by the Indian tribes of centuries ago, is a well known fact. The Huron Indians, who resided along the shores of Lake Huron and Lake Simcoe, were undoubtedly familiar with this comparatively short water route to the Bay of Quinte. After paddling across Lake Simcoe and up the Talbot River for some little distance, they portaged across to Balsam Lake, the summit waters between Georgian Bay and Lake Ontario. Hence we to-day have [illegible] from Lake Simcoe to Balsam Lake, what is known as the "Portage Road." Who knows but some trail that was used by the Indian tribes of several hundred years ago?

Champlain, the French explorer, was the first white man to come down from Lake Huron to Lake Ontario by way of what was to be known, nearly three hundred years later, as the Trent Canal. This was in the year 1615. The story of Champlain's trip over these waters is told by Francis Parkman in his history, "Pioneers of France in the New World," a most interesting. Champlain had gone up the Ottawa River and portaged over to Lake Nipissing, came down the French River into Lake Huron. His expedition down through the lakes and rivers that now constitute the Trent Canal is best told in the historian's own words:

At the outlet of Lake Simcoe they all stopped to fish,—their simple substitute for a commissariat. Hence, too, the intrepid Etienne Brulé, at his own request, was sent with twelve Indians to hasten forward the five hundred allied warriors,—a dangerous venture, since his course must lie through the borders of the Iroquois.

He set out on the eighth of September, and on the morning of the tenth, Champlain, enjoying in his Manitoulin to see the meadows sparkling with an early frost, soon to vanish under the bright autumnal sun. The Huron fleet pursued its course along Lake Simcoe, across the portage to Balsam or Sturgeon Lake, and down the chain of lakes which form the sources of the river Trent. As the long line of canoes moved on its way, no human life was seen, no sign of friend or foe; yet at times, to the fancy of Champlain, the borders of the stream seemed decked with groves and shrubbery by the hands of man, and the walnut trees, laced with grape-vines, seemed decorations of a pleasure-ground.

They stopped and encamped for a deer-hunt. Five hundred Indians, in line, like the skirmishers of an army advancing to battle, drove the game to the end of a woody point; and the canoe-men killed them with spears and arrows as they took to the river. Champlain and his men keenly relished the sport, but paid a heavy price for their pleasure. A Frenchman, firing at a buck, brought down an Indian, and there was need of liberal gifts to console the sufferer and his friends.

The canoes now issued from the mouth of the Trent. Like a flock of venturous wild-fowl, they put boldly out upon Lake Ontario, crossed it in safety, and landed within the borders of New York, or on a point near the mouth of Hungry Bay.

The First Survey

IT is just 75 years ago since the first survey was made of the proposed route of the Trent Canal. Twenty-four years later the project was discussed at considerable length in "Canadian Pamphlets," and a review of the efforts of the people of the Trent District to have the scheme carried to a successful issue is as interesting to-day as it no doubt was at that time. In reading the extracts [illegible] taken from "Canadian Pamphlets," it will be observed that the Georgian Bay-Ottawa River Canal scheme was a [illegible] issue at that [illegible] year [illegible] in [illegible]—but it looks certain that in the next [illegible] the completion of the Trent Canal, although a great many years on the way, will be [illegible] from Georgian Bay to Trenton, before the larger scheme of the Ottawa River route is more than actually commenced. "Canadian Pamphlets" [illegible]: "In the year 1833 the project of connecting the waters of Lake Simcoe and those of Ontario by means of a Canal passing through Rice Lake and the Bay of Quinte [illegible] and received the attention of the Government. Mr. N. H. Baird [illegible] was appointed by His Excellency Sir John Colborne to make a survey of the route connecting these two Lakes with a view of deciding upon the eligibility of the same for construction. He entered upon the work in 1833 and in that year completed the survey of [illegible] and Trent River. Having received further instructions, he resumed the survey in 1834 and [illegible] it from Rice Lake through the Otonabee and back waters to Lake Simcoe. The report [illegible] was exceedingly favourable. The estimates for the work under the scheme proposed of opening up an uninterrupted water communication between the Bay of Quinte and Lake Simcoe, a distance of about 155 miles, and 700—4 feet of lockage, £[illegible].

Mr. Baird [illegible] appears to have feared that the amount of the estimate might deter the Government from proceeding with the work, to which he attached very considerable importance. He therefore [illegible] the [illegible] sections of the Canal should be at once proceeded with, and the other portions followed. "By which," says the report, "[illegible] navigable [illegible] of these intermediate sections along the [illegible] can be [illegible] or [illegible] for [illegible] by the [illegible] industry of [illegible]." The estimate of the probable expense of [illegible] between Lake Simcoe and the Bay of Quinte on the double [illegible] was £[illegible].

[illegible] as almost [illegible] one as the double scheme. [illegible] proposed [illegible]. With the view of doing away with the only [illegible] the [illegible] idea of frequent transhipment—I would propose [illegible] capacity [illegible] and so arranged as to admit of the trade [illegible] being [illegible] landings, direct either for Lake Huron, or Lake Simcoe as the case [illegible] can be done in such a way as to be [illegible] useful, [illegible] such time as it may be deemed proper to put the lockage [illegible] respective wants of the country."

The project [illegible] was the [illegible] which attached [illegible] at the time, was never carried out. Some £90,000 odd was expended upon the River Trent work, and the lock at Peterborough [illegible] Mr. Baird was [illegible], but the troubles of 1837-38, and the changes which [illegible], prevented the full execution of the project of connecting the waters of Lake Simcoe with the Bay of Quinte. The necessity for such a work [illegible] has never been lost sight of. Within the last two or three years the project of connecting the waters of Huron with those of Ontario or the St. Lawrence, with a view of directing the [illegible] and growing trade of the Western States through Canadian channels—[illegible]—has engaged the attention of the people and press, not only of Canada, but of

Chicago and the Western States. Two projects to that end are before the public: the one to connect the Georgian Bay with the City of Toronto, preliminary surveys of which have already been made, showing it to be a work of great, though by no means insuperable difficulties, and the other to connect Lake Huron with the Ottawa, a project to which Mr. Walter Shanly, one of our ablest Provincial Engineers, has given his attention. But it is quite evident that neither of these schemes, important as they unquestionably are, can for a single moment compare with that projected in [illegible], to which reference has been made. The first, in addition to the immense outlay of the work, $25,000,000.00, owing to the heavy cuttings that require to be made, and the great engineering difficulties that must be surmounted, offers but problematical advantages as a national work. That it would prove of very great advantage to the City of Toronto and divert much of the western trade through that city is unquestioned, but when this has been said, the only argument has been adduced that can be advanced in its favour. It opens up no new country, and the produce once in Ontario through Toronto stands equal chance of finding its way to the Atlantic through American as through Canadian channels. The second proposal, that of connecting the waters of Lake Huron with those of the Ottawa, stands deservedly high as a national enterprise. If constructed it would open up an immense region of country now absolutely useless, and it would have the effect of placing Canadian channels far before any other for the conveyance of the produce of the west to the markets of Europe, advantages which cannot be overlooked in the construction of the national work. But the heavy outlay required on such a work is likely to retard its completion for many years. The route via Peterborough and the Trent, while offering advantages almost equal to those of the Ottawa Canal as regards the opening up of the country and the development of trade by the St. Lawrence, is so much less expensive as to offer much greater prospect of immediate construction. The advantages of the Trent route were thus epitomised in a letter recently addressed by W. S. Conger, Esquire, to the Chief Commissioner of Public Works:

First.—It is shorter and more direct than any other—except the Toronto and Georgian Bay which, from its great cost, may be set down as impracticable—from Chicago and the Sault Ste. Marie to the seaboard, whether via Montreal and Quebec or Portland or New York.

Secondly.—It passes through a rich and fertile country, and presents fewer engineering difficulties, and could therefore be constructed for a much smaller amount, than either of the other proposed routes.

Thirdly.—Being at least two degrees further south than the Ottawa route, it would have the advantage of being open for two or three weeks longer every season.

Fourthly.—Its terminal harbours would be large and commodious—particularly that at the mouth of the Trent—having an easy exit into the Bay of Quinte, and on the other by a short and comparatively inexpensive cut to the Presqu'ile Bay, the safest and most commodious harbour on Lake Ontario, thus affording an easy and safe entrance to Trenton from Lake Ontario and the River St. Lawrence.

The advantage of the Trent River in point of distance may be estimated by the following figures:

From Chicago to New York, via Buffalo and Erie Canal	1,415 miles
From Chicago to New York, via Welland Canal and Oswego	1,318
From Chicago to New York, via Huron, Nipissing, Ottawa & Caughnawaga Canal	1,258
From Chicago to New York via Georgian Bay, Valley of the Trent and Oswego	1,232
From Chicago to Montreal via Lake Nipissing	905
From Chicago to Montreal via Georgian Bay and Valley of the Trent	903

It will thus be seen that in point of distance to New York the Trent route has the advantage over the Nipissing and the Ottawa route by 26 miles. While between Chicago and Montreal the distance is [illegible] less by the Ottawa route, 20 miles, its advantage, however, more than overbalanced by the shortness and difficulties of navigation of the latter.

But the pages of a work like this are hardly the place wherein to discuss this subject, and the reader is therefore requested to regard the remarks relative to the merits of the Trent Canal scheme now before the public as parenthetical in their character.

Such was the position of the various Lake Huron-Lake Ontario canal schemes as viewed by Canadian Engineers in the year 1857.

Such

Started By Imperial Government

As has already been stated, the locks just below the City of Peterborough and the locks at Hastings on the Trent River were built in the year 1844 or thereabouts. The construction of these two locks was the first step in a practical effort to connect Georgian Bay and Lake Ontario by means of this route, and they were built by the Imperial Government. As a matter of fact, a lock was also built at about the same time at Glen Ross, better known perhaps in early days as Chisholm's Rapids, about 14 miles above the town of Trenton. Why Chisholm's Rapids was selected as one of the most important points to build one of the first locks on the system, few at this date can even imagine, as it could not afford any local benefit, nor did it throw open any substantial navigable stretch of waterway. Its gates never opened to greet a friendly vessel, its grey limestone walls never re-echoed to the sound of the steamer's whistle, and for 70 years or more it stood as a monument to the enterprise of the Imperial Government. The lock at Chisholm's was demolished only a year or two ago, to make room for the substantial and modern concrete lock, which is already completed, and which is one of the 8 locks now being built on the Ontario-Rice Lake section of the Canal. The lock at Hastings, which afforded a means of navigation from Healey's Falls to Peterborough, a distance of 55 miles, remained in commission until one year ago, when it was closed and demolished to be replaced by a more modern and much larger one. The lock at Peterborough has been deepened since its original construction, but its walls are about the same as they were when first built.

Other locks had been built at several points, but their construction was more with a view to meeting the requirements of local interests rather than with a view to a scheme of through navigation. In fact, as far back as the year 1836, a lock was built by the "Inland Water Commission" at Bobcaygeon, which afforded a means of navigation from Sturgeon Lake to Pigeon, Buckhorn and Chemong Lakes. In the year 1837, the construction of a lock was commenced at Lindsay on the Scugog River, and it was placed in commission in the year 1843. It opened a stretch of navigation to Port Perry and other points on Lake Scugog. In 1869, a wooden lock was built at Rosedale, connecting Balsam and Cameron Lakes, and about the same date the building of the present lock at Young's Point was undertaken. When completed a few years later, it afforded navigation for vessels between Lakefield and Burleigh Falls and other points on Stony Lake.

However, the idea of connecting Lake Huron and Lake Ontario by means of a canal through the Trent Valley was by no means dead. The interest taken in the project by Sir John Colborne, Lieutenant-Governor and afterwards Governor-General, had induced many settlers from the Old Country to establish themselves on these waters, and the subject came up for discussion and renewed interest at intervals. About 1865 Mr. W. S. Conger, M.P. for Peterborough, called attention to this great route for transportation, and [illegible] advocated its construction by appeals to the Government, and by speaking constantly of its merits in the House and in the press. Nothing was done at the time, and in 1867, at the time of Confederation, the British North America Act reserved the works on these waters and their control for the Dominion of Canada, preparatory to the completion of the project.

Soon after 1870 Mr. Mossom Boyd, of Bobcaygeon, took up the matter, accumulated much information, and by his energetic advocacy stimulated renewed discussion in the press. He obtained a charter for its construction as a private enterprise, and even proceeded to London to secure the support of capitalists, but circumstances at the time were not propitious, and he was not successful in his efforts.

In 1878 the question was again brought up in a new light. The Ontario Government obtained from the Mackenzie Administration a transfer to them of the works on the Trent, and this was strongly opposed in the local press, as giving up property expressly reserved at Confederation and virtually abandoning the idea of ever opening the Trent Waterway for transportation. The opposition leaders supported this view and when that [illegible] they succeeded to power they rescinded the order-in-council making the transfer. In the years 1878 to 1880 considerable survey work was done with a view to proceeding with the construction of the Canal. Mr. David Stark, C.E., and Mr. Tom S. Rubidge had been in their turn engaged in the work. Mr. Thos. D. Belcher became Superintending Engineer.

The agitation by the people of the Trent Valley district broke out again strongly about the years 1880 and by the year 1883 contracts were let by the Dominion Government for the construction of the locks at Fenelon Falls, Buckhorn, Lovesick and Burleigh Falls. About 1887 these sections were thrown open for navigation, completing an inland stretch of navigation from Balsam Lake to Lakefield. About the same time the demand for the completion of the Canal became stronger and more emphatic than ever. Trent Canal Associations were organized, deputations representing the entire district from Midland to Trenton visited Ottawa, and hot newspaper editorials were handed out and oratory with a vengeance and a Canal flavor was to be heard at public meetings.

Mr. Thomas Rubidge, one of the Government Engineers in charge of the work, was accused of being lukewarm on the project, and a glance at the report and estimate made by him on the proposed work would certainly go to show that he was not bubbling over with enthusiasm for the completion of the Canal. The Government of John A. Macdonald finally decided to appoint a commission to enquire into the merits of the proposition. This appointment was not very enthusiastically received by the friends of the project, who felt that the feasibility of the scheme, as well as the necessity, had been long ago established. However, the commission was appointed in 1887. It was composed of Messrs. Judge Weller, Peterborough; John Kennedy, C.E., Montreal; and Frank Turner, C.E., Toronto. They were to consider the question of further extending the line of water communication between Lake Huron and Lake Ontario, and to determine whether it is advisable that an extension of the main work should be undertaken and if so to what extent; and under date of December 17th, 1890, these Commissioners, after personally going over the route, taking evidence at various points, including Kingston, Montreal, Albany, and Buffalo, reported:

In considering the bearing of the Canal upon the development of the trade and natural resources of the country through which it will pass, it should be noted that the conditions are peculiar, inasmuch as it would act as a connecting link in a chain of lakes and streams which for the most part lie transversely to the line of the Canal, and that it would therefore afford access to an extent of country and water line much greater than usual in a Canal of its length.

The Commissioners, upon the evidence and information which they have been able to obtain, and which accompany this report, are of opinion that the extension of the main work should be undertaken by the completion, as soon as convenient and practicable, of the work necessary to give continuous navigation from Georgian Bay to the Bay of Quinte. This would embrace the sections between Lakefield and Peterborough and between Healey's Falls and Trenton. In the opinion of the Commissioners a waterway would thereby be made which would not only increase the value of the works already constructed but would assist and develop the industries along its route and open up the resources of the country through which it would pass, to such an extent as to amply compensate for the expenditure necessary to be incurred, although the work itself would not be expected to produce direct revenue.

This conclusion is arrived at by a careful consideration of the evidence adduced before the Commission, by which the Commissioners feel they must be guided, such evidence to their minds greatly preponderating in favor of the extension of this important work in the manner indicated.

Although the Commission reported favorably to the completion of the Trent Canal in December 1890, and although strong pressure was brought to bear upon the Government of the day to have new sections undertaken, it was not until 1896 that any move was made in this matter. Contracts were, in that year, let for the construction of the division extending from Lake Simcoe to Balsam Lake, and for the Peterborough-Lakefield section. One of the contracts on the Peterborough-Lakefield section included the construction of the Peterborough Lift Lock, while the Kirkfield hydraulic lift lock was included in one of the contracts of the Lake Simcoe-Balsam Lake Division. The Peterborough hydraulic Lift Lock was opened in June 1904, and the Kirkfield Hydraulic Lift Lock in July 1907, thereby throwing open a stretch of navigation 160 miles in length, from Orillia to Healey's Falls.

The Peterborough-Lakefield Division and the Balsam Lake-Lake Simcoe Division were built under the supervision of Mr. R. B. Rogers, M. Can. Soc. C. E., who from 1896 to 1907 was Superintending Engineer of the Trent Canal. When it was first suggested that hydraulic lift locks should be built on the Trent Canal, Mr. Rogers was instructed by the Department to proceed to Europe with a view of studying the matter of lift locks and their uses, and report to this Department the result of his investigations. Mr. Rogers made the trip, gave the subject thorough investigation, acquired a large fund of information, having inspected three European locks in operation, and reported favorably to the feasibility of hydraulic lift locks on the Trent Canal. Mr. Rogers was in charge for the Government of the construction of both hydraulic lift locks.

In the year 1907 the Government decided to build the southern outlet of the Canal. Accordingly in August of that year the first contract on the Ontario-Rice Lake Division was let. The work on this Division is dealt with elsewhere.

[illegible]

[illegible]

A Toronto View in 1887

It has been mentioned elsewhere that the Trent Canal scheme has at times received very little support from a certain section of the Canadian press. The friends of the Trent Canal declare this to be especially true regarding the press of the City of Toronto. It must, however, be noted in all fairness to the press of the province generally, that a more friendly interest has been displayed in the project during the past few years. That at least one Toronto daily paper had little faith in the scheme as a means of through navigation as late as the year 1887, may be seen from the following editorial from the Toronto *Mail* of October [illegible] of that year.

The announcement that a commission has been appointed by the Dominion Government to enquire into the advisability of proceeding with the construction of the Trent Valley Canal suggests the fact that that great public undertaking has enjoyed—on paper—an extended and somewhat chequered career. The Canal was proposed in the year 1826. It is, therefore, after sixty-one years of discussion regarding it—for it has been talked about at every election—that the authorities have concluded that they are not quite sure the public requirements demand it. Delay, however, may not be fatal to the enterprise. Canal projects die hard, as witness the struggles of the Huron and Ontario Canal. Moreover, they have a habit of reviving just when it is supposed their last hour has come. The Murray Canal, for example, was projected in the year 1797. Interest in it waxed and waned until 1882, or thereabouts, when, though everybody supposed the enterprise had collapsed, a contract was suddenly let for its construction. It was proceeded with thanks to the political exigencies of the Government of the day, and is now an accomplished fact.

The original Trent Valley Canal proposition was not so extensive a scheme as that of to-day. The idea of its projectors was merely to furnish a route by water from Lake Ontario to Lake Simcoe. The region in the neighborhood of Lake Simcoe was the Northwest of that period, and people were anxious to open it up for settlement and for trade. It was not until 1833 that the Canal was reported on by an Engineer, and it was then declared that two million dollars would complete it. It was at once resolved to proceed, but the work did not commence until 1837. For two years operations proceeded vigorously. In 1839, however, there was a stringency in the money market during which the cash borrowed for the Canal was devoted to other projects, and as a result the contractors abandoned the work. In 1846 an attempt was made to revive interest in the scheme and to enlarge it so that it might provide a through avenue of navigation from Lake Ontario to the Georgian Bay. But the Board of Works reported that as a through line the Canal would not be successful, owing to the great lockage required and the limited depth of water of vessels which could be used on the route, and that for purposes of local traffic it would not be a success, because the route, through its greater part, was extremely circuitous. The estimated cost of the Canal was placed at [illegible], and it was suggested that instead of [illegible] the works already undertaken should be completed and used as timber slides. This plan was adopted, and the cost of the work up to the year of Confederation was $670,878.00. From Confederation on it has been impossible to convince successive Governments that a through Trent Canal is practicable. The first Conservative Government took little stock in the project, and the Mackenzie Government, after an effort to take over and complete the works had failed, passed the whole affair—locks, dams and slides, over to the Ontario Government. The transfer having been accomplished just two days before the Reform Government went out, it was claimed that the object was to destroy the dams, reclaim several thousands of acres of land which had been submerged for years, and in fulfilment of a campaign promise, distribute them through the Ontario Government among certain favorites in the various constituencies along the route. This accusation was stoutly denied, and it was stated very plausibly that the works were passed over to Ontario because they were merely timber slides, and because the Government had resolved not to complete them with a view to the establishment of a through system of navigation.

In 1879 the Dominion re-assumed the works, and it has them still. The authorities have from time to time expressed opinions and adopted measures which have led the residents of the Trent Valley district to believe that the Government seriously intends to build the Canal. In the 1882 election the belief helped the Conservatives in Central Ontario counties, but in 1887 it was less potent, not because the Conservatives had altered their plans, but because the Reform candidates professed to be as [illegible] as any person could be that, despite the opposers, the Canal should be built. In future contests the politicians [illegible] the district through which the projected work will run will no doubt vie with each other in their pledges of devotion to the interests of the Canal. The result will be that the work will be forced upon the party leaders, although it is almost a certainty that none of them approves of it.

Further

[illegible]

[illegible]

The Present State of Canal

AT the date of the publication of this work, the extent of the finished portion of the Trent Canal is 160 miles, the distance from Washago, ten miles above Orillia, to Healey's Falls, now available for navigation by vessels of 5½ feet draft. There is, however, in addition to this, a considerable extent of inland navigation for the draft mentioned, by which side trips might be taken, such as to the picturesque town of Barrie on Kempenfeldt Bay, on the western side of Lake Simcoe, to Jackson's Point, on the south shore of Lake Simcoe, or to Lindsay on the Scugog River, continuing further down the stream to Port Perry on Scugog Lake.

After more than seventy years of a checkered career, it now begins to look as if the Trent Canal, as a means of through transportation from Georgian Bay to Lake Ontario, will be an accomplished fact within the next four or five years. At the present time, the entire division from Healey's Falls to Trenton is under contract, and the work is being advanced with vigour by the various contractors. The fact that the Dominion Government has this year set aside the sum of $1,750,000 for construction work on this division shows that the energetic policy decided upon, with respect to the early completion of the Canal, will be carried out with the least possible delay. As a matter of fact, it is regarded as extremely probable that several of the above mentioned contracts (there are seven in all) will be finished by the end of the present year. The contract for the section of Canal in the vicinity of Campbellford, which has been awarded to Messrs. Henry Quinlan & Robertson, is the heaviest undertaking on this division, and it may be two or even three years yet before it is completed, and before boats may be able to travel from the land-locked waters of Lake Simcoe to the broad expanse of Lake Ontario.

It should be mentioned also that the locks, now under construction on the division extending from Trenton to Healey's Falls, and in fact extending up to Peterborough, are being built so as to provide for a 8 ft. 6 inch draft. This will accommodate barges of 1,000 tons. It is intended that ultimately the entire Canal will be deepened to accommodate vessels drawing 8 ft. 6 inches of water, with a minimum depth of nine feet between the locks.

However, even with the completion of the work at present under contract between Healey's Falls and Trenton, through navigation will not be effected from Georgian Bay to Lake Ontario. There is yet to be placed under contract the section extending from Lake Simcoe to Georgian Bay, a distance via the Severn River of 30 miles. The work on this section of the Canal is not considered very heavy, consisting of the building of five or six locks and dams. The advocates of the early completion of the Trent Canal are hopeful that the Government may place this section under contract within the next twelve months, so that it may be finished concurrently with the Healey Falls-Trenton Division (officially known as the Ontario-Rice Lake Division), thereby completing within the next few years, a Canal that will afford a water route from Sault Ste. Marie to Montreal shorter by 280 miles than that by the Welland Canal.

The Ontario-Rice Lake Division

IN the annual report of the Department of Railways and Canals for the year ending March 31st, [illegible], being the latest annual report of the Department on hand, is found some very interesting information concerning the nature of the work, and its rate of progress in making the Trent Canal navigable for vessels of 8 feet 4 inches draft, when completing the southern outlet of the Canal. Mr. A. J. Grant, Superintending Engineer, who is in charge of the work, says:

"This division embraces the fifty-six and a half miles of all river route between Trenton on Lake Ontario and Rice Lake, which will comprise when completed, nine and a half miles of canal, thirteen miles of submerged channel, and thirty four miles of deep river, whose average width will be about 800 feet. The rise between extreme low water level of Lake Ontario and normal navigation level of Rice Lake of 369 feet, which rise will be overcome by [illegible] locks ranging from [illegible] to 27 feet in height. Fourteen concrete dams, with stop-log sluices, will be required for the regulation of the river, and at these 75,000 h.p. gross may reasonably be developed at the low water stage of the river, and this quantity may be increased somewhat by a larger expenditure in mill race excavation. The normal navigation level of the natural reaches of the river and Rice Lake will be that of ordinary summer level, so that practically no damage will be done by flooding the land along the river and lake shores. In the reaches the dams will hold the river at as high a level as practical, which, in the majority of cases, will be lower than the top of the river banks. The canals and channels with sides sloping above water, and have a minimum bottom width of 80 feet, except in two cases of short canals above locks where the bottom width will be only 50 feet. Also the submerged channels will have a minimum bottom width of 100 feet, which will be marked at frequent intervals by spar buoys. The canals and submerged channels will have a depth of 9 feet.

"There will be sixteen bridges, two of which will be for highways and six for railways. They will all be swing or bascule spans, except that for the main line of the Grand Trunk Railway at Trenton Junction, which will be a high level fixed bridge, under which there will be a clear head room of 25 feet at a stage of high water in Lake Ontario.

"The locks will be of concrete and will have 8 feet 4 inches of water on the sills, with chambers 33 feet wide by 175 feet long between hollow quoins. They will accommodate barges of 1,000 tons, whose size will be about 140 feet long by 30 feet beam, and drawing 8 feet of water. Entrance piers of not less than 150 feet in length will be provided above and below each lock. The locks will be filled through culverts 6 feet wide by 5 feet high in the side walls, which will be equipped with wagon valves for controlling the water. The lock gates will be of the solid timber type and the upper gates at all locks will be set on the top of the walls. They will be operated by means of [illegible] working in hand power winches set in recesses which will be formed in the lock walls.

"The total cost of the improvement of this part of the Trent Navigation will amount to about $6,700,000, the first vote for which was made by Parliament during the session of 1907. The project involves the removal of about one and a half million cubic yards of earth, one and a quarter million cubic yards of stone and shale rock, and the building of about [illegible] thousand cubic yards of concrete."

[illegible]

As to The Future

THE advocates of the construction of the Trent Canal, as a means of through navigation from Lake Huron to Lake Ontario, are to-day more than ever convinced that when the waterway is completed it will be an important factor in the grain carrying trade between the great west and the Atlantic seaboard. While it has, up until a few years ago, received very little support from the large industrial centres of Canada not situated upon its route and which may not derive any immediate benefits from its completion, it is at present, owing to the great increase of wheat production and transport generally speaking, receiving the hearty support of every section of the Dominion of Canada. The present Minister of Railways and Canals, Hon. G. P. Graham, has displayed keen interest in the project and the work of completing the waterway has proceeded under his administration with greater vigor than at any time in its history. A certain section of the press of Canada, has hitherto always been more or less hostile towards the project, but those who have for years fought so determinedly in its behalf are hopeful that in a few years hence they will see barges, laden with grain from the great West, passing down its course.

The old Erie Canal, with a draft of slightly more than five feet, can hardly, in the matter of carrying capacity, be compared with the Trent Canal, with its draft of 8 feet 4 inches, yet the advocates of the Trent waterway point with pride to the part the Erie Canal has played in the transportation interests of the United States. It is pointed out that the incalculable benefits which have been derived from the Erie Canal in the past are not disputed by any one. To it, more than to any other one cause, is due the phenomenal growth and commercial supremacy of the City and State of New York. It opened up the great West to settlement, and in turn attracted the products of the West to the low-grade line through the Appalachian chain, which exists only in the State of New York. The tolls on this waterway have more than repaid the cost of construction, maintenance and operation. In addition, it has paid over $900,000,000.00 in freight money within the limits of the State, and the disbursement of this money along the line of the Canal has built up the great inland cities from Buffalo to Albany, forming a continuous line of commercial centres, which has no counterpart in any other State. The growth of these Cities in turn led to the construction of railways paralleling the Canal, and these, by consolidation and scientific management, have gradually reduced the cost of transportation, with all the advantages such a reduction necessarily brings. With the completion of the Trent Canal not only will transportation rates generally be reduced to points along its route, but a good percentage of the grain that passes through the "Soo" Canal, on its way from the West, will be conveyed to Europe by way of the Trent to Montreal and the seaboard.

One of the ablest speeches that has ever been delivered on the practicability and desirability of the Trent Canal and its possibilities as a factor in through transportation was made by Mr. R. R. Hall, who some few years ago represented West Peterborough in the Dominion House of Commons. Mr. Hall, who had given the Trent Canal and its future a most careful study, in addressing the House on this matter, amongst other things, said:

The consumption of coal in the City of Peterborough last year was 43,470 tons. The rate on coal from Suspension Bridge to Peterborough by rail is $1.25 a ton. Coal is delivered in Oswego at 5 cents a ton cheaper than at Suspension Bridge. Freight between Oswego and Trenton or Port Hope is 25 cents a ton, and the rate between Port Hope and Peterborough, by rail, though only a distance of 30 miles, is 80 cents a ton. On coal alone the freight from Trenton to Peterborough, once the Canal completed, would not be more than 25 cents per ton. On that basis there would be a clear saving on coal to Peterborough of 75 cents a ton or, on the amount consumed last year, a total saving of $12,000.

After dealing very exhaustively with the project Mr. Hall concluded by saying:

When you take into consideration the fact that we have the means right in the very heart of the Province of Ontario of establishing a 750 ton barge Canal which will have a capacity of carrying practically two and a half million bushels of grain from Midland to Montreal, I think you will admit that it is a means deserving of the most serious consideration, and that the Canal is a work which should be immediately gone on with as part of our national system of grain transportation.

It will be observed that Mr. Hall referred to the Trent Canal as a 750 ton barge waterway. Since that time the Government decided on building the new sections of the Canal with a draft of 8 feet 6 inches on the lock sills, thereby providing for the use of 1,000 ton barges. The Ontario-Rice Lake section of the Canal is being built with an 8 feet 6 inches draft, and any renewals that may be made from time to time on the older portions of the Canal will be on the same scale.

[illegible]

[illegible]

As To Power Development

The Trent Canal as a producer of electrical power is doing much towards the industrial development of this section of the province of Ontario. Roughly speaking, the various dams, along the line of the Trent Canal from Lake Simcoe to Trenton are capable of developing 100,000 electrical h.p. Of course all the dams are not at the present time developed for the reason that the district is not as yet able to handle all the power that is in sight. However, the demand is rapidly increasing and new dams along the canal are each year being developed, and the towns and villages for many miles adjacent thereto are being supplied with light and power at low rates as the Niagara district, which is supposed to have the cheapest light and power in the province.

Every available water power along the route of the Canal, with one or two exceptions, has been acquired either by municipalities, or by private companies. The ownership of these powers was acquired many years ago, and in determining the usual riparian rights were a matter that gave the Government considerable difficulty. However all matters of this kind are now adjusted, and while the Government does not receive a revenue from all the water powers on the Canal, certain dams, however, which were taken over by the Government and improved, are revenue producers in so far as the Government is concerned. The leases provide for the use by the power companies of the surplus water after the purposes of navigation have been served. It is estimated that the rentals for surplus water at various dams will, when fully developed, yield a revenue to the Government of Sixty or Seventy Thousand dollars per year.

The following tables give the location of the dams, with their respective h.p. and hydraulic power on the line of the Trent Canal.

FROM LAKE ONTARIO TO RICE LAKE

	H.P.
DAM No. 1.—[illegible] miles from Trenton Junction, 17.8 ft. head. A reasonable low level of Lake Ontario—head of 20.0 ft. may be obtained. With a 17.5 ft. head, the amount of h.p. developed is	3,077
DAM No. 2.—1.4 miles from Trenton. 20 ft. head	4,500
DAM No. 3.—At Glen Miller, 1.6 miles from Trenton. A 17 ft. head can be developed here only with the consent of [illegible] in connection with Messrs. Miller Bros. Limited who are now using a head of [illegible]. In the event of Messrs. Miller Bros., Ltd. not consenting, a head of only 10 ft. can be obtained. A 20 ft. head would produce	5,137
DAM No. 4.—3.2 miles from Trenton, having a head of 25 ft.	4,000
DAM No. 5.—4.6 miles from Trenton, having a head of 20 ft.	3,000
DAM No. 6.—At Frankford, 8.? miles from Trenton, 20 ft. head. The surplus water at this point is owned by The Trent River Power Company. There is developed here	3,350
DAM No. 7.—At Glen Ross, 14.2 miles from Trenton. By a large expenditure of money a head of 8 ft. at this dam could be obtained. Difficulties might occur [illegible] the present head of 8 ft. at this dam may be somewhat reduced. A 8 ft. head would produce	1,456
DAM No. 8.—At the foot of Myer's Island, 20.4 miles from Trenton. A 20 ft. head can be developed [illegible] by the excavation of about 20,000 cubic yards of rock for a tailrace and a 30 ft. head can be obtained at a still greater cost for tailrace excavation in rock. There is a 20 ft. head available without any tailrace excavation. A 20 ft. head would give	[illegible]
DAM No. 9.—At the head of Myer's Island there is a 21 ft. head available without any expense on tailrace excavation. With considerable tailrace excavation a 24 ft. head can be obtained, which would develop	5,464
DAM No. 10.—At Ranney's Falls, [illegible] Campbellford and 30.? miles above the town of Trenton. A 60 ft. head is in course of development in the vicinity of Lock No. 10	10,000
DAM No. 11.—Known as Crowe's Rapids, just above the Town of Campbellford. The power at this point is developed by the Seymour Power Company. There is a head at this point of 18 ft. Amount of power developed	4,347

DAM No. 18.—At foot of Crow Bay. This power is developed by the Municipality of the Town of Campbellford. The head is 20 ft. Power developed at	1,500
DAM No. 10.—At Healey's Falls, 2 miles below the Village of Hastings. A head of 75 ft. can be obtained at this dam by the expenditure of considerable money in [illegible] structures. This is considered the most valuable water power on the Trent Canal system, and is under lease to the Seymour Power Company. The Electric Power Company, Limited. It is not yet developed but, with a 75 ft. head will produce	10,000
DAM No. 14.—At Hastings, owned and developed by the Fowlds Company. There is a head of 6 ft., which is slightly reduced during the high water season. A 9 ft. head will give	1,200
Total amount of h. p. available between Lake Ontario and Rice Lake	16,[illegible]

The flow of the Trent River from below Healey's Falls to Trenton is estimated at [illegible] cubic feet per minute. At Healey's Falls and Hastings the flow of the river is estimated at 60,000 cubic feet per minute.

FROM RICE LAKE TO STONY LAKE

DAM AT [illegible], just below the City of Peterborough. This dam is not developed. It has a head of 8 ft. at low water, but during the high water season this almost disappears, hence the power is of little value. However, if a head of 8 ft. could be maintained, and taking the flow of the river at 60,000 cubic feet per minute, the amount of power available would be	2,000
DAM AT LONDON STREET, Peterborough, leased and developed by the Peterborough Hydraulic Power Company (The Quaker Oats Company)	3,400
DAM AT AUBURN, owned and developed by The Peterborough Light and Power Company (The Seymour Power Company, Limited)	1,400
DAM KNOWN AS WATERWORKS DAM, just above City of Peterborough, owned and developed by the City of Peterborough	1,000
NASSAU DAM, owned and developed by The Canadian General Electric Company	1,000
DAM No. 5, Peterborough-Lakefield Section. Leased to and developed by the [illegible] Power Company. This dam, along with No. 4, a short distance above, can be jointly developed to provide	[illegible]
DAM No. 3.—Leased to and developed by the Canada Cement Company	1,000
DAM No. 2.—Not yet developed, owned by the Dominion Government	1,000
DAM No. 1.—Owned and developed by The Dickson Company, of Peterborough	1,000
DAM AT YOUNG'S POINT.—Owned and controlled by the Canada Cement Company	500
Total h. p. on this section	[illegible]

In the estimate of the amount of available power on this section, the figures furnished by the Ontario Hydro-Electric Commission are used, with the exception of the estimate on the dam just below the City of Peterborough and the Young's Point Dam. The Hydro-Electric Commission's estimate on the dams from Peterborough to Lakefield is considered to be very conservative, the flow of the river being reckoned at 64,000 cubic feet per minute. It is pretty generally conceded that the low water flow of the river from Clear Lake to Rice Lake is 80,000 cubic feet per minute.

FROM STONY LAKE TO CAMERON LAKE

BURLEIGH FALLS DAM.—[illegible] Company.) There is a head here of 28 ft. Taking the flow of the river at 30,000 cubic feet per minute the amount of power that may be developed will be	[illegible]
BUCKHORN DAM.—Owned by the Electric Power Company. Not yet developed. A head of 10 ft., and a flow of the river at 30,000 cubic feet per minute, the amount of power available here would be	1,500
BOBCAYGEON DAM.—Taking the flow of the river at 30,000 cubic feet per minute, with a 10 ft. head, the amount of power available is	1,000
FENELON FALLS DAM. The surplus water at this dam is owned and developed by the Light, Heat and Power Company of Lindsay. The head here is 24 ft., and the flow of the river is estimated at 45,000, giving electrical h. p. to the extent of	3,000
The total amount of h. p. on this section therefore is	[illegible]
	[illegible]

Few people realize that the 100,000 electrical h. p. capable of being developed along the Trent Canal from Balsam Lake to Trenton, is equal to 1,000,000 tons of coal for which we are paying the United States four million dollars annually.

The 100,000 electrical h. p. above referred to does not include the power developed on the Severn River, which flows from Lake Simcoe to Georgian Bay.

[illegible]

[illegible]

[illegible]

As a Tourist Resort

THE route of the Trent Canal consists of a chain of lakes and rivers unsurpassed on the Continent in their varied attractiveness as tourist resorts. It is only within recent date that these picturesque waters have been commercialized in the respect of being advertised as tourist resorts, but to-day there is not one available point or island on the lakes and rivers throughout the entire system that is not dotted with pretty summer homes or comfortable hotels, maintained almost exclusively for the tourist traffic. The growth in the popularity of these waters, as an ideal spot to spend the summer months, has been really astonishing, and to-day they are receiving a degree of advertising by railway companies equal to that given the much older established but no more attractive resorts, such as the Thousand Islands and Muskoka.

A certain section of the Trent Canal is commonly known as the Kawartha Lakes. Kawartha is the Indian word for "Bright Waters and Happy Lands." They comprise fourteen beautiful lakes—Scugog, Sturgeon, Cameron, Balsam, Pigeon, Bald, Sandy, Buckhorn, Chemong, Deer, Lovesick, Stony, Clear and Katchewanooka—to which may also be added Rice Lake, [illegible] miles down the Otonabee River below Peterborough.

The altitude of these famous lakes lends them additional charm for the tourist and pleasure seeker, some of them being 830 feet above sea level, over 600 feet higher than Lake Ontario and 200 feet higher than Georgian Bay. On these charming waters the pleasure seeker will find delightfully cool, wooded shores and sandy beaches, where bathing may be indulged in with safety.

The accommodation for travellers at the various points on these waters is much superior to the average summer resort. For those who wish to take their family for an outing, the privilege to camp on the shores of these waters affords a vacation at a very moderate expense. The hundreds of miles of shore and the many islands of the Kawartha Lakes specially lend themselves to the enjoyment of a summer outing. The Kawartha Lakes being a part of the Trent Canal are linked together by numerous locks and channels, which allow the boat of the pleasure seeker to pass from one to another until the whole chain is explored. The eye never tires, there is variety at every stroke before the rounding of a point, the passage of a lock or the threading of a narrow channel opens before you a new prospect. The dip of an oar, the stroke of a paddle, the bend of a river, or the turn of a pine island is enough to bring a fresh scene in the Kawartha panorama into view.

These Highland Lakes of Ontario are like, and yet unlike, the Scotch lochs. They do not possess the awful grandeur of those of Scotland, nor the bold ruggedness of some of the Scotch lochs, yet there is about them an inspiration more subdued but powerful. While every point and island, every bay and headland, glows with a quietly picturesque beauty. Slowly threading a narrow passage between verdure-laden islets, the rounding of a point will suddenly bring into view a broad expanse of water whose continuous shores seem to form an unbroken line. Hidden behind some island or promontory, however, will be found a passage leading through another labyrinth of beautiful scenery, and just as further progress seems impossible another miniature sea breaks on the view.

Lovely as were the Kawartha Lakes when Nature displayed them to advantage before the enraptured gaze of Samuel de Champlain and his Indian allies, yet now, with all this Nature then did, improved by the artistic ideas of man, they are simply enchanting. Travellers in Scotland, or readers of Sir Walter Scott's or other descriptive works of "The Scottish Highlands," are not unfamiliar with the wild grandeur of the Scotch lochs, and all this magnificence is reproduced within the compass of the Kawartha Lakes. The more the scenery is studied the more convinced one becomes that the charms which are spread out beneath a Canadian sky can vie with the most lovely which are contained under foreign climes. The student of geology, the botanist, and the amateur photographer find a field well worth while in the Kawartha country.

As for the canoeist, in the wildest district of Ontario is one broad continuous network of lakes extending to Georgian Bay, and the voyages to be taken by the enthusiastic lover of the canoe have but one limit—the time at the disposal of the voyager.

The Hydraulic Lift Locks

In attempting to describe the hydraulic lift locks on the Trent Canal, we can not do better than to reproduce a few extracts from a paper prepared by Mr. Walter J. Francis, C.E., [illegible] M.Can.Soc.C.E. Mr. Francis, at the time of the construction of these locks, was in the service of the Department of Railways and Canals, and had immediate charge of the work. In January, 1907, Mr. Francis read a paper at the annual meeting of the Canadian Society of Civil Engineers at Toronto, his subject being "Mechanical Locks in Canada." While space will not permit of our using the article in its entirety, it is hoped that the extracts taken therefrom and published below will give the reader some slight idea, at least, of the hydraulic lift locks on the Trent Canal. Mr. Francis said in part:

"Built for the Canadian Government, by Canadian contractors, under the direction of Canadian engineers, the hydraulic locks on the Trent Canal may properly bear the label, 'Made in Canada.' In view of the fact that the German Government has recently completed a high lock lift at Henrichenburg, and that the United States Government has [illegible] detailed study of the problem of mechanical lifts in connection with the reconstruction of the Erie Canal, a detailed description of the Canadian hydraulic locks may be considered appropriate at the present time.

"The larger of the two Canadian locks is situated on the Trent Canal within the limits of the corporation of the city of Peterboro, and has been in operation since [illegible], 1904. The other lock is at the village of Kirkfield, on the stretch of canal joining Balsam Lake and Lake Simcoe.

"The hydraulic lock is essentially an automatic machine and is designed to take the place of ordinary locks where a great difference of level is found in a short distance. Besides the Peterborough and Kirkfield locks, there are three other locks of this type in operation, one being in England, another in Belgium, and the third in France. The English lock has been in continuous use for over thirty years, while those in France and Belgium have been completed about twelve years. They all have a lift of about fifty feet. The depth of water in the French and Belgian locks is 7 feet 0 inches, and the lock chambers are 141 feet long and nineteen feet wide. Several others having similar dimensions are now being built by the Belgian Government. The chief dimensions of the Peterborough Lock are, 65 foot lift, chambers 140 feet long, with 33 feet clear width, and 8 feet [illegible] depth of water. The Kirkfield lock has the same general dimensions, with a lift of 50 feet. It will be noticed that in the Peterborough lock the water load is double that of the larger European ones, while the height of the lift is increased over thirty per cent.

"In principle the hydraulic lock may be likened to two immense hydraulic elevators of the simple plunger type, having their presses connected together so that the descent of the one causes the rise of the other. In place of the ordinary elevator platform we have a large watertight box or tank closed at either end by a gate. The tonnage is [illegible] by moving the vessel into this box of water and then closing the gate on the end of the box as well as that of the end of the canal, thus leaving the box independent of the canal, the box or tank moving vertically. The box with the water and the floating vessel is then raised or lowered to the other reach. The chamber at the top of descent is loaded with a few inches more water than the other chamber, thus giving it the necessary additional weight or surcharge, as it were, to cause the ascent of the other when water communication is established between the two presses. The construction of the Canadian locks varies materially from those of Europe, and so far as outward appearance goes, there is little similarity. The departures are largely due to the climatic conditions and to the [illegible] proposed adopted by members of the European engineers in steel construction.

"For purposes of detailed description, the Peterborough lock will be taken first, and the differences in the Kirkfield structure will be noted later in the paper."

[illegible]

[illegible]

A gradual slope was selected for the site of the Peterborough lock, and the excavation was completed in 1900. The location was chosen so that the average depth of excavation was about 40 feet, and the material thus obtained was used in building embankments to carry the level of the upper reach to the head of the structure. The excavated material was found to be hard clay mixed with small stones and boulders, underlying a thin layer of fertile soil. At the upper end of the excavation a small amount of hardpan was encountered, and below this a shaly limestone rock. The rock was in layers of from ½ inch to 8 inches in thickness, between which were [illegible] layers of clay and shaly material. The layers of crystalline limestone stand the weather quite well, but the shaly parts disintegrate very rapidly under the action of rain and frost. The elevation at which rock was found was exceedingly fortunate, being practically at the bottom of the pits. When the rock was cleaned off less than two feet of concrete brought the floor to its proper grade. No footings were required under any of the walls, all being built upon the solid rock.

After dealing in detail with the construction of the press walls in which the large presses stand, Mr. Francis' paper gives a description of the substructure of the lock. It is built entirely of concrete and contains a little over 26,000 cubic yards. The breast wall is forty feet thick and 65 feet high, the length being 120 feet at the base. The towers, also of concrete, are on the same transverse centre line as the walls. In round numbers, the total height of each tower from rock bottom to top is 100 feet.

"The earth embankment upon which the canal is carried up to the head of the breast wall was built in layers under 12 inches in thickness, thoroughly compacted by rolling. During the hot and dry season the earth filling was liberally watered. The material was clay containing small stones. This method produced an embankment having the remarkable record of settlement of only about [illegible] feet in a period of nearly a year where the depth of made earth was upwards of forty feet."

The contract for the embankments and substructure was executed by Messrs. Corry & Laverdure of Ottawa, and completed in 1902.

Dealing with the superstructure, Mr. Francis says:—

The superstructure of the Peterborough lock was built by the Dominion Bridge Company, of Montreal. The work was commenced in the summer of 1901, and the structure was completed early in July, 1904. The cost of the superstructure complete was $244,000.00.

Each of the lock chambers is 139 feet x 33 feet, with in front 8 inches of planking on the sides. These dimensions, with the exception of the depth of water, were fixed by a Government Commission. It is also necessary that a clear headway of 25 feet be left above the water level. The depth of water for which the lock is constructed would in ordinary navigation language be called 8 feet on the sills. The load of water which each of the lock chambers contains is 1,300 tons, and this is the maximum load which it is necessary to provide for, since a floating vessel displaces only her own weight of water.

The structural steel work was minutely described by Mr. Francis, as well as the gates and their mechanism, and the main presses and rams. After manufacture and before erection, all the castings of the presses were subjected to a rigid hydraulic test, of a gauge of 1,200 lbs. per square inch, being twice the working pressure.

As to the materials and general appearance, Mr. Francis says:—

A summary of the amounts and various kinds of metal used in the superstructure is as follows:—Rolled steel, in plates and shapes for the lock chambers and gates, [illegible]900,000 lbs.; cast iron in rams, counterbalance guides, and various machines, 495,000 lbs.; steel castings for the main presses and accumulator, 805,000 lbs.

Care has been taken throughout to make the general appearance of the work as attractive as possible. All the walls and walkways are protected by suitably ornamented railings, and the windows and doorways are closed by ornamental grille-work. The lockmaster's cabin on the top of the centre tower is constructed of concrete as high as the window sills. Above this the steel frame work is furred with wood, and the whole of the exterior covered with copper. The interior is finished in British Columbia wood of the natural color.

Many people who visit the hydraulic lift locks and see them in operation are at first puzzled to know how the space between the lock chamber and the frame of the reach gate is made water-tight. Mr. Francis explains this, thus:

There is a space of nearly 2 inches between either end of the lock chamber and the frame of the reach gate. When it is desired to connect the lock chamber with a reach, this clearance space has to be closed. This is done by having a collapsible rubber tube fastened to the frame of the reach gate and arranged so as to fit. When the lock chamber is in position for communication, the rubber tube is inflated with air at about 40 pounds per square inch pressure, which causes it to expand and press against the end of the chamber.

The operation of the lock is described by Mr. Francis as follows:—

The operation of the hydraulic lock requires three men—a lockmaster and two assistants or gatemen. The lockmaster is in charge and is responsible for the structure. Two gatemen are required, one at the lower end and the other at the upper, to open and close the gates, to inflate or deflate the seal tubes, and to operate the capstans. The gatemen also take charge of vessels at stops 300 feet on either side of the lock. The lockmaster, during operations, stays at his cabin on the top of the centre tower and has full view of all that transpires. He is also in communication with the two gatemen by a simple signal system. The lockmaster has before him the principal levers, and through an interlocking system regulates the working of the lock. The levers for controlling the gate engines and the capstans are located on the wall immediately above the respective machines, convenient of access to the gatemen. The interlocking system is so arranged that the lockmaster must set his levers in proper order, and also having done so neither he nor the gatemen can err by using their levers in the wrong order.

In order to get a clear idea of the complete mode of operation, let us assume that both the chambers are down to the lower level, empty, as they are at the end of winter, and it is desired to prepare them for navigation purposes. The annular space in each of the presses is empty and is filled with water. The main valve on the connecting pipe will be closed and water will be pumped into one of the presses until the ram, with its superimposed chamber rises to the level of the upper reach. An examination of the case will show that it is necessary that the ascending chamber, in order that it shall be able in descending to move the other to take the full upward stroke, must contain a volume of water greater than the rising chamber contains. This extra amount is equal to the volume of one of the rams, since the change that takes place during the relative motion of the two chambers is that the ram of the descending chamber becomes constantly immersed, while the other protrudes. In other words, the descending chamber is losing weight while the ascending is constantly becoming heavier. It is also necessary that extra water weight be provided so as to overcome the friction of the guides and of the stuffing boxes of the ram and presses. The area of each lock chamber is so great that it requires only an additional depth of 12 inches to give an extra load of water of 100 tons, which is sufficient for ordinary operation. The addition to this weight will of course aid in the effect of accelerating, because of the relative change of position in the chambers. The ordinary time required in raising the chamber through the whole elevation is about two minutes. But this will depend upon the adjustment of the ram glands, the plenty of oil pumped on the guides, and the manipulation of the main valve in the hands of the lockmaster.

An ordinary lockage is conducted in this manner. Suppose 100 tons of overcharge has been found to give sufficient additional weight to the descending chamber. The uppermost chamber will then be required to stop with its floor 12 inches lower than the bottom of the upper reach, the communication being established with the reach, allowing from the latter 100 tons more than the lower chamber contains, assuming the depth of both reaches to be the same. Then the total operations to make the lockage, [illegible] the steps following the reached are

[illegible]

opened and the seal valves are inflated, [illegible] hauling the vessel into the chamber and securing her there securely, closing the gates, deflating the seal valves, and opening the main valve between the presses. The heavier chamber then commences to descend, the motion being allowed to increase gradually by the gradual opening of the valve until it reaches the maximum speed. At about three-quarters of the stroke the main valve is slowly closed, communication between the presses being entirely cut off when the end of the journey is reached. The change in elevation being made, the seal valves are inflated, the gates are opened, and the vessel or vessels are free to go on their journey, after being towed out by the capstans. The surcharge contained in the descending chamber slowly flows out into the lower reach, while [illegible] ready to perform the next lockage [illegible] is the chamber which has just reached the higher elevation.

"The actual lockage, or lift, in the Peterborough lock is 15½ minutes, being the whole time from the stopping of the vessel at the lower reach to her proceeding on her journey under her own steam in the upper reach.

The Reservoir Waters

THE Trent Canal district may be said to have [illegible] attached to Ontario the first real practical demonstration [illegible] the value of water conservation. While the Trent Canal has been heard of for many years, and has, in its day, constituted a sort [illegible] political football in which perhaps both of the great political parties have played, it is at the same time, as a canal, a waterway for the transportation of the products of the country that it has been advocated and to which it has [illegible] been referred. This waterway which when completed will run through the midland counties of Ontario, connecting Georgian Bay with Lake Ontario, at Trenton, constituting a route for barges of [illegible] feet 4 inches draught fully 200 miles shorter to Montreal than by the Welland Canal, is in reality nearing completion. It will, therefore, be a matter of a short time only until the advocates of this route will have an opportunity of demonstrating to the world, if they can, that the Trent Canal, projected nearly 75 years ago, can carry grain from Midland to Montreal at cheaper rates and in faster time than by the Welland route.

However, it is not along this line that we are now going to discuss the Trent Canal, the rather in the manner by which electrical power has been developed along its route, and the factor it is playing in the industrial development of its district. Next to the Niagara, there is no district in older Ontario at least, in which the water falls are being developed to a greater degree than along the line of the Trent Canal. There have been a number of crude [illegible] dams on this waterway for many years back, at which power has been to a limited extent developed. It has been during recent years only, however, that the great possibilities in power development on the Trent Canal have been fully realized. Efficient and modern power houses are now looming up at the various dams, and the district throughout is traversed by a network of power transmission lines.

This is due to two main reasons. Firstly, it might be stated that the final adoption of the route the Canal should take at certain points, and the erection in subsequent years of concrete dams by the Dominion Government for Canal purposes, made many valuable sites available for the development of power. These dams are, at the present time, practically all occupied. Most of them are already being used in the development of electrical energy and the remainder of them are about to be utilized. They are owned by various private persons, joint stock companies and municipalities. The nature of the titles to, and power privileges in connection with, these dams vary considerably. Some of these are owned outright by private individuals and they are entitled to all the surplus water without any yearly rental. The dams they hold were erected many years ago, either before a canal was seriously thought of or before the value of water powers was understood. Other dams are merely leased from the Government, the terms of the leases varying, upon payment of a certain annual rental being based, of course, upon the amount of power developed. Both dams of these are now placed under the control of the Railway Commission in so far as the matter of rates to consumers of power is concerned. This was a very wise move on the part of the present Minister of Railways and Canals, as it ensures to the public the delivery of power at a reasonable price.

But the remarkable development of electrical power on the Trent Canal is not due to this alone. The flow of the Otonabee and Trent Rivers, on which the great portion of the power is developed, has, by a judicious and aggressive policy of conservation, been increased to such an extent that it has contributed perhaps to a greater degree than the construction of new dams to the present highly satisfactory state of affairs, and has indirectly also contributed to the development of the towns and villages along the route of the Canal. When it is realized that the flow of the Otonabee River at Peterborough has increased over 60 per cent during the past five years, one can realize that water conservation on the Trent Canal has been a reality.

Until five years ago, the waters of the Trent Canal and the waters of what is known as the Trent Canal watershed were under separate management. That is, the main lakes and rivers that constitute the Trent Canal proper were under the control and management of the Dominion Government, while the [illegible] feeders thereto were under the control of the Government of the Province of Ontario.

[illegible] must be borne in mind that the County of Haliburton and those portions of the counties of Peterborough and Victoria north of the main line of the Canal, contain almost countless lakes of various depths and sizes. A glance at a map drawn on a reasonably large scale, on which these lakes are shown, would undoubtedly surprise one who is not personally familiar with the locality. Some of these lakes are quite large. Redstone, for instance, in the township of Guilford, having an area of 3,6[illegible] acres; Kennisis, in the township of Havelock, having an area of 3,833 acres; and Gull Lake, in the township of Lutterworth, having an area of 2,740 acres. These lakes empty into various streams that finally discharge into the Trent Canal. The two of the largest of these are known as the Gull River, which flows into Balsam Lake at Coboconk, and the Burnt River, which flows into Cameron Lake, just above Fenelon Falls.

Likewise there are other streams that are valuable as feeders to the Trent Canal, a list of which, together with the areas, in acres, of their basins, is as follows:

	ACRES		ACRES
Gull River basin	90,8[illegible]4	Deer Bay Creek basin	2,347
Burnt River basin	22,[illegible]	Buckhorn Creek basin	835
Nogies Creek basin	67[illegible]	Squaw River basin	24
Mississagua basin	[illegible]	Jack's Creek basin	4,[illegible]
Eel's Creek basin	3,863		
		Total	[illegible]

This does not include the Crow Bay waters, which empty into the Trent River below Healey's Falls. Crow Bay waters are still under the control of the Ontario Government.

During the year 1904 an agitation was started by the power users along the Trent Canal, as well as by the navigation interests, to have the control of above-mentioned watershed, or what is now commonly known as the reservoir waters, transferred from the Province of Ontario to the Dominion Government, in order that there might no longer be a dual system of management in connection with the water that finally passes through the Otonabee and Trent rivers on the main line of the Canal. Until then the minimum flow of the Otonabee River at Peterborough was 64 000 cubic feet per minute. There was no uniform flow of water, for the reason that it was practically impossible under the conditions then existing, to control it.

At certain periods of the year—during the spring and early summer—an unnecessary amount of water came surging down the Otonabee and Trent Rivers, while by the month of August there was not enough water to drive the wheels of the various power users on the Canal, or supply the requirements of the navigation interests. This state of affairs was due to the fact that those in charge of the tributary waters had no interest whatever in those streams other than to assist the lumbermen in getting out their logs. The Ontario Government had built sluice dams at the outlets of many of these lakes, which were controlled by the Provincial Department of Public Works. The dams were built and operated in the interests and for the sole benefit of the lumbermen. When the lumbermen would drive out of the various lakes there would be an abnormal and unnecessary flow of water come down into the main Canal. The stop logs would remain out until the following spring, when the same process would be gone through.

[illegible] was argued, and quite properly so, that if the entire water of the Trent Canal watershed, together with the water in the main line of the Canal, were placed under one management, a system of conservation could be inaugurated whereby, without any interference with the rights of the lumbermen, a steady and increased flow could be made to pass down the

Otonabee

Otonabee and Trent Rivers at all seasons of the year. It was, of course, contended that the control should be vested in the Dominion Government in view of the requirements for navigation purposes. After some months of negotiation in which prominent men of the district, regardless of political creed, took part, the transfer to the Dominion Government was made in July, 1906, the Provincial Government handing over all lakes, rivers, and streams tributary to the Trent Canal, north of Peterborough. The Dominion Government agreed to protect the rights of the lumbermen in respect of the use of dams on these streams, and guaranteed to them all privileges they had hitherto enjoyed.

The Department of Railways and Canals, under whose control this splendid watershed now passes, at once got busy. Money was voted for the repair, reconstruction and improving of the dams at the outlets of these various lakes. The old timber dams were in many instances replaced by substantial concrete structures. Others were repaired and tightened, and in nearly every other case the dams were raised by many feet over their former level. On the various streams good, competent, and experienced men were placed to operate the stop-logs of the different dams, and an almost perfect system was built up. The result of the work is thus far most surprising. The water is now conserved in the springtime. The lumbermen's drives are taken out with care, and by using only what water may be absolutely required. The stop-logs are immediately replaced after each drive passes out, and the water is banked up and held there as it may be required in the late summer or fall months on the main Canal.

The beneficial results are clearly indicated. The flow of the River Otonabee was increased to 80,000 cubic feet per minute, being [illegible] twice the flow [illegible] was five short years ago. Power development of each dam has correspondingly increased, and more power is accordingly available for distribution throughout the district.

It must be borne in mind that the system is not yet extended to the full limit of its possibilities. Each year more new reservoir dams are being built, and for some years to come there will be scope for still further improvement. An extreme dry spell may [illegible] to some slight extent, due to the greatly increased capacity of the various power plants, yet there is not a power company operating on the Trent Canal, especially from Peterborough down, that will not say that the flow of water in the Trent Canal has been steadier, more uniform, and 100 per cent. greater throughout the entire year than it was five and six years ago.

There is no doubt, therefore, that water conservation in this district has been successful to a most surprising degree. There is no doubt also, that the successful working out of this policy has resulted in great industrial growth which is as yet in its infancy, for the reason that many of the best dams of the Trent Canal are only now being harnessed with a view to supplying the very attractive market which awaits it.

It is only fair to say that the success of this scheme is in a very large measure due to the superintendent of the Canal, Mr. J. H. McClellan, who had given the matter a thorough study, and has maintained throughout that degree of enthusiasm with which [illegible] some years ago entered upon the work.

[illegible]

188,465 Acres of Water

It will surprise many to know that the area of the various lakes that form the part of the Trent Canal from Balsam Lake to Trenton is 96,079 acres. To this may be added the area of what is commonly termed the Reservoir Waters, all of which is 92,386 acres. This, therefore, would mean that, exclusive of the many fairly large rivers and streams, there is this 188,465 acres of water flowing continuously down through the Trent. This area is made up as follows:

RESERVOIR WATERS

	ACRES		ACRES
Gull River basin	40,500	Jack's Creek basin	4,[illegible]
Burnt River basin	22,958	Crow River basin	10,449
Nogie's Creek basin	,83	Deer Bay Creek basin	2,647
Mississauga basin	7,902	Eels Creek basin	953
Bell's Creek basin	2,650		
Squaw River basin	34		92,386

	ACRES		ACRES
Balsam	9,500	River Buckhorn to Burleigh and Deer Bay	4,49
Cameron	8,300	Stony and Clear	9,87
Scugog	0,000	Rice	9,000
Sturgeon	8,300		
Pigeon	1,000		
Chemong	8,400		96,079
Buckhorn	1,900	Total	188,465

Of course, Lakes Simcoe and Couchiching, which are on the line of the Trent Canal, have an area of 288 square miles. Their waters, however, flow through the Severn River into Georgian Bay, and after flowing over Niagara Falls join their neighboring waters of Balsam Lake in the Bay of Quinte.

The Crow River basin of 10,449 acres flows into the Trent Canal just below Healey's Falls. The Superintending Engineer of the Canal, in his annual report to the Department, estimates the low water flow of the Trent River below the point at which the Crow River basin enters at 2,000 cubic feet per second, while at Healey's Falls his low water estimate is 800 cubic feet per second.

The Charts Explained

In making a trip over the Trent Canal, yachtsmen or others who may desire to refer to the charts herein will observe that these charts have been arranged in the following order:

1. Chart of Lakes Couchiching and Simcoe.
   (From the entrance to the Canal at Beaverton to Balsam Lake, no chart is required, the channel following the Talbot River for some distance, and the remainder of the distance being through an artificial reach.)
2. Chart of Balsam Lake and Cameron Lake.
3. Chart of Sturgeon Lake.
4. Chart of Pigeon Lake.
5. Chart of Buckhorn Lake and Chemong Lake.
6. Chart of Deer Bay and Lovesick Lake from Buckhorn to Burleigh.
7. Chart of Stony Lake and Clear Lake.
   (The channel from Young's Point to Peterborough through Lake Katchewanooka and the River Otonabee is easily located without the aid of a chart.)
8. Chart of Otonabee River and Rice Lake.

Digitized by

Height of Locks

The following table gives the location of the locks, with their respective lifts, on the Ontario-Rice Lake Section now under construction

No. of Lock	Miles from Trenton	Location of Lock	Lift of Lock
	[illegible]	Trenton Junction	20 ft
[illegible]	[illegible]		20 ft
2	5 [illegible]	Glen Miller	27 ft
[illegible]	6 .2		[illegible] ft
[illegible]	[illegible]		18 ft
[illegible]	7 .6	Frankford	[illegible] ft
[illegible]	15 .9	Glen Ross	[illegible] ft
[illegible]	25 [illegible]	Percy Landing	20 ft
[illegible]	26 [illegible]		[illegible] ft
9	27 [illegible]		24 ft
[illegible]	29 .6	Ranney Falls	24 ft
2	28 [illegible]	Ranney Point	24 ft
[illegible]	32 [illegible]	Campbellford	23 ft
[illegible]	33 [illegible]	[illegible] Falls	25 ft
[illegible]	[illegible]	Crow Bay	23 ft
16	38 [illegible]	Healey Falls	[illegible] ft
	[illegible]	Healey Falls	27 ft
18	5[illegible] .2	Hastings	[illegible] ft

It will be seen by the above table that the total lift from Lake Ontario to the reach above the Hastings lock is [illegible] feet. The new lock at Hastings, replacing the old lock built about the year 1837 was thrown open for traffic this spring, and there is once again through navigation at Healey's Falls.

The following table gives the location of the locks, with their respective lifts, on the navigable portion of the Canal from the Otonabee River below Peterborough, to Balsam Lake, the summit waters of the Trent Canal.

	Length	Width	Depth on sill	Lift
Lock at Peterboro	[illegible]	33 ft	[illegible] ft	[illegible] ft
Lock at No. 1 Peterboro Lakefield Division	[illegible] ft	33 ft	[illegible] ft	[illegible] ft
Lock at Peterboro Hydraulic lift lock No.	[illegible] ft	33 ft	[illegible]	[illegible] ft
Lock at No. [illegible] Peterboro Lakefield Division	[illegible] ft	33 ft	[illegible] ft	11 ft
Lock at No. [illegible] Peterboro Lakefield Division	[illegible] ft	33 ft	[illegible]	11 ft
Lock at No. 3 Peterboro Lakefield Division	[illegible] ft	33 ft	[illegible] ft	12 ft
Lock at No. [illegible] Peterboro Lakefield Division	[illegible] ft	33 ft	[illegible] ft	[illegible] ft
Lock at No. [illegible] Peterboro Lakefield Division	[illegible]	33 ft	[illegible] ft	16 ft
1 Lock at Young's Point	34 ft	33 ft	[illegible] ft	[illegible] ft
2 Locks at Burleigh each [illegible] ft (upper	34 ft	33 ft	[illegible] ft	
Lower	[illegible] ft	33 ft	[illegible] ft	23 ft
1 Lock at Lovesick	34 ft	33 ft	[illegible] ft	[illegible] ft
1 Lock at Buckhorn	34 ft	33 [illegible]	[illegible] ft	[illegible] ft
1 Lock at Bobcaygeon	34 ft	33 ft	[illegible] ft	7 ft
2 Locks at Fenelon Falls each 12 ft (upper)	34 ft	33 ft	[illegible] ft	
(Lower	[illegible] ft	33 ft	[illegible] ft	24 ft
1 Lock at Rosedale	[illegible] ft	33 ft	[illegible] ft [illegible] in	[illegible]

It will be observed that the lift from below the City of Peterborough on the Otonabee River to Balsam Lake is [illegible] feet.

The following table gives the location of the locks with their respective lifts, after leaving Balsam Lake and descending to Lake Simcoe:

	LENGTH BETWEEN GATES	WIDTH	DEPTH ON SILL	LIFT
[illegible] Kirkfield Hydraulic Lift lock No. 36	[illegible] ft.	33 ft.	[illegible]	50 ft.
1st No. 1 Simcoe-Balsam Lake Division	[illegible] ft.	33 ft.	[illegible] ft.	[illegible] ft.
2nd No. 2 Simcoe-Balsam Lake Division	142 ft.	33 ft.	[illegible]	[illegible] ft.
3rd No. 3 Simcoe-Balsam Lake Division	142 ft.	33 ft.	8 ft.	11 ft.
4th No. 4 Simcoe-Balsam Lake Division	[illegible] ft.	33 ft.	[illegible] ft.	14 ft.
5th No. 5 Simcoe-Balsam Lake Division	142 ft.	33 ft.	6 ft.	[illegible] ft.

It will be observed that Lake Simcoe is 134 feet lower than Balsam Lake.

The Cost of Construction

The following table shows the amount spent each year and the total amount spent to the 31st March, 1910, on the Trent Canal chargeable to Capital Account:

Government expenditure prior to Confederation	$ 508,87[illegible] [illegible]	1895	53 907 78
[illegible]	[illegible]	1896	348 976 08
[illegible]	—	1897	196,875 78
[illegible]	—	1898	35 273 3
1883	49,767 1	1899	105 [illegible] 43
1884	20,563 11	1900	[illegible] 563 01
1885	31 [illegible] 84	1901	284 503 69
1886	75, [illegible] 20	1902	4[illegible],871 45
1887	70,[illegible] 43	1903	635,050 7
1888	14,379 35	1904	[illegible] 44
1889	[illegible] 13	1905	353,25[illegible] 6
1890	[illegible] 10	1906	318,[illegible] 40
1891	1,[illegible] 49	1907	13,048 12
1892	1 157 28	1908	343 [illegible] 05
1893	1 [illegible] 87	1909	[illegible],830 36
1894	3,[illegible] 32	1910	[illegible],[illegible] [illegible]
		Total	$7,873 [illegible] [illegible]

Some Distances

The following table of distances on the Trent Canal may be found both useful and interesting.

ON MAIN LINE OF CANAL	Miles
Port Severn to Washago, via Severn Bridge	34 [illegible]
Washago to Narrows	10.0
Narrows to Gamebridge	[illegible]
Gamebridge to Balsam Lake	[illegible]
Balsam Lake to Rosedale River	[illegible]
Rosedale Bridge to Fenelon	[illegible]
Fenelon to Bobcaygeon	14.[illegible]
Bobcaygeon to Buckhorn	[illegible]
Buckhorn to Burleigh	[illegible]
Burleigh to Young's Point	[illegible]
Young's Point to Lakefield	[illegible]
Lakefield to Peterborough	[illegible]
Peterborough to Rice Lake	[illegible]
Rice Lake to Birdsall's	[illegible]
Birdsall's to Hastings	[illegible]
Hastings to Trent Bridge	[illegible]
Trent Bridge to Healey's Falls	[illegible]
Healey's Falls to Campbellford	[illegible]
Campbellford to Chisholm's	[illegible]
Chisholm's to Frankford	[illegible]
Frankford to Trenton	[illegible]
ON CHEMONG LAKE	
Chemong Park to Buckhorn	3.8
Chemong to Bobcaygeon	16.[illegible]
ON CLEAR AND STONY LAKES	
Young's Point to	
End of Clear Lake	[illegible]
Juniper Island Store	[illegible]
Boschink	[illegible]
Crow's Landing	[illegible]
Head of Lake	[illegible]
Juniper Island to Burleigh	3.[illegible]
Crow's Landing to Burleigh	[illegible]
ON OTONABEE RIVER	
C.P.R. Bridge to G.T.R. Bridge (Peterboro)	.[illegible]
Wolfe St. Wharf to lower end of Peterboro Lock	1.[illegible]
Wolfe St. Wharf to [illegible] Boat House	.75
Lower End Peterboro Lock to Crawford's Grove	[illegible]
Wolfe St. Wharf to Crawford's Grove	[illegible]
Wolfe St. Wharf to Hale's Bridge	[illegible]
Peterboro Lock to Hale's Bridge	[illegible]
Hale's Bridge to Bensfort Bridge	[illegible]
Wolfe St. Wharf to Wedlock's	[illegible]
Wolfe St. Wharf to Jubilee Point	[illegible]
Wolfe St. Wharf to New Cut	[illegible]
Bensfort Bridge to Wedlock's	[illegible]
Wedlock's to Jubilee	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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ORILLIA

In view of the commercial importance of the construction of the Trent Valley Canal, it is natural that the attention of those interested in this great project should be directed to the Town of Orillia, which is rapidly becoming the great Industrial Centre of Northern Ontario. Orillia, which is situated on the western shore of Lake Couchiching, and which also overlooks Lake Simcoe, has quickly developed into a town of importance. Its position, and the push, enterprise and energy of the townspeople have been the chief elements to make it what it is. Orillia is a progressive, picturesque and healthful town of six thousand five hundred people. Not the least of her great advantages is her easy accessibility and her excellent railway and transportation facilities. Three great Railways now run through the town, The Grand Trunk, The Canadian Pacific and The Canadian Northern, which will assure rapid development for her industries, as transportation rates will be the cheapest and the best. As an example of the enterprise of her citizens, Orillia was the first Municipality in Ontario to develop a Water Power and build an Electric Power Transmission Plant, which was done in 1900 at the Severn River, and all her industries are now run by electricity. A low and special rate is offered to all industries, and many of these have been brought here through this attractive power rate. From this Plant twenty-two hundred horse-power is being used at the present time for Municipal and Manufacturing purposes, and one thousand horse power is now being added. There are one thousand men employed in the various factories. The Tudhope Motor Company employ three hundred men, The Tudhope Carriage Company, one hundred; The Canada Refining and Smelting Company installed their new plant in the town in the fall of [illegible], and are now enlarging their plant to [illegible] double the capacity. The Canada Wood Specialty, The Long Manufacturing Company, The Eaton Planing Factory, together with various other Manufacturing Concerns, are all running to their full capacity and contemplate extending their plants. These, and other industries have caused growth for the town, and during the last year the population increased by more than seven hundred. Building of various kinds is going on in every direction, and it has been carefully estimated that over one-quarter of a million dollars worth of building and improvements will be done within the town limits during this season. The optimist expects Orillia to outgrow her town status during the next five years and to have become the Industrial City of Northern Ontario.

From a Summer Resort standpoint the town is well known and her principal charms arise from her situation on the two beautiful lakes, Couchiching and Simcoe. Lake Couchiching is about sixteen miles in length and five miles in width, and contains many beautiful islands. The whole region is full of scenic beauty and is a delight to all lovers of nature. One of the principal attractions of the town from a Summer Resort standpoint is its splendid fifteen acre lakeside park, known as Couchiching Beach Park, which also forms the recreation ground for the townspeople and tourists. Boating is one of the favorite pastimes. Canoes and [illegible] steamers, sailing craft and motor boats are everywhere in evidence. Tennis and [illegible] and tennis courts are found on many of the private lawns. For those fond of golf there are excellent golf links, and these are patronized daily by a large following. Orillia is a town of well-shaded streets, of exceptionally fine homes, of beautiful shaped lawns, and of fine churches, schools and civic buildings. On the shores of the lake are situated the summer homes of people from Canadian and American cities. Some come from as far south as New Orleans.

Orillia, with the two-fold advantage of being an industrial and railway centre, as well as a summer resort, must become one of the most important towns along the route of the Trent Canal. Lakes Simcoe and Couchiching form a link in this great waterway system, and both empty into the Severn River, which will be the outlet of the Canal to the Georgian Bay. Surely such a grand location at the junction of the Trent Canal and the three Transcontinental Railways must give promise of a greater future for the already progressive, thriving and flourishing Town of Orillia.

The Town of Barrie

IS situated at the head of Kempenfeldt Bay, Lake Simcoe, in shape resembling horseshoe. It is the County Town of Simcoe, Province of Ontario, and has the County Municipal Buildings, and Law Courts. BARRIE is on the main line of the Northern Division of the Grand Trunk Railway, 60 miles north of Toronto, and is the divisional point of five branches of the G. T. R. BARRIE has a service of [illegible] trains arriving and leaving daily and a continuous heavy freight traffic. BARRIE owns and operates its own Electric Light Plant. The price of light per 1000 Watts is 9 cents. An all day service of power for power purposes at low rates will be quoted to applicants.

BARRIE'S population is 6,250.

BARRIE owns and operates its own Waterworks System, which is managed by a Commission. The supply from Artesian wells is inexhaustible and is absolutely pure, in fact the purest on the Continent, being 8 per cent. above par by analysis. The capacity per day of [illegible] is 2,500,000 gallons; fire pressure 80 lbs., domestic pressure 80 lbs. The price for single tap the rate is $9.00 per annum. The price for 1000 galls. by meter is 25 cents domestic.

BARRIE has 25 miles of cement sidewalks and splendid roads.

BARRIE has 5 Banks, 10 Hotels, Local and Long Distance Telephones, 4 Printing and Newspaper Offices, 2 [illegible], Armouries, Theatre, Public Library, Y. M. C. A., Gas Plant and a 50-roomed Hospital.

BARRIE has an excellent drainage system and is a very healthy town to live in. Its [illegible] is entirely Northern.

BARRIE is beautifully situated and has natural scenery in abundance, is the resort for tourists, and often termed "The Venice of America." Kempenfeldt Bay affords good boating, fishing and bathing.

BARRIE is the home of the Barrie Tannery, Barrie Carriage Works, Canada Producer and Gas Engine Co., Barrie Planing Mill, The Bell Planing Mill Co., and other industries.

BARRIE has many advantages for manufacturers of Woodenware, Knitting Mills, Tanneries, Shoe Factories, Wood Factories, etc., and has a number of excellent factory sites at a very low figure.

BARRIE has plenty of labour, both skilled and unskilled.

BARRIE is surrounded by a magnificent farming country and has a good market for live stock, produce, grain, etc.

BARRIE'S boat service connecting with Orillia and other towns and resorts on Lake Simcoe, is good and improving yearly, and is greatly appreciated by summer tourists. It has within a few miles unlimited lake shore front suitable for summer cottages and summer residences.

BARRIE Citizens' Band is a first-class organization and gives free concerts weekly throughout the summer months.

ORGANIZATIONS AND SOCIETIES.—Barrie Bowling and Tennis Club, Barrie Horticultural and Town Improvement Society, Barrie Aquatic Club.

BARRIE SPORTS.—Swimming, Boating, Fishing, Bowling, Tennis, Golf, Ball, Lacrosse, Driving, Motoring, etc.

Over—

Fenelon Falls, Ontario

TO the thousands of campers, tourists, owners of power yachts, from both Canada and the United States who annually spend their summer vacation on the beautiful chain of lakes between Balsam and Cameron Lakes, comprising the Trent Canal, no summer resort is more favorably known than Fenelon Falls, Ont. This charmingly situated little town is practically a key to one of the most beautiful sections of the Kawartha Lakes. To the tourist who depends upon his canoe or paddle or merely himself and his summer outfit from point to point, no more admirable situation of picturesque location could be selected. The everlasting roar of falling water soothes the nerves of the man who, in town or city, has his nerves upset by the strenuous competition of modern life. The Fenelon River placidly flowing past the hotel at which he may stop, with its tree-crowned banks, whose impressive nature is daily assured by upspringing from cracks and crevices in the massive granite, teems with game fish. In the shadow of the granite banks lurk maskinonge and black bass only waiting for the spoon of the troller or the bait of the still fisherman. Within a few hundred feet of the admirably conducted and well provided hotel of Fenelon Falls is one of the best fishing grounds of water may be so described to be found in our grand Dominion. Fenelon Falls can boast of having some of the finest and best managed hotels of Ontario.

The drinking water of Fenelon Falls is exceptionally pure and good. From Fenelon Falls the owners of gasoline and steam launches can readily ply to all parts of the Trent Canal system. The summer visitor thus has magnificent boating, fishing and bathing within a few feet of his hotel. The public steamboat service is unsurpassed. Fenelon Falls is within easy reach of Lindsay, Peterboro and Toronto by rail.

Manufacturers seeking locations where cheap power and transportation are an essential factor should keep Fenelon Falls in mind. Electric power is here to be had for $18.00 per horse-power. The Town Council and Board of Trade of Fenelon Falls, both active and progressive municipal bodies, offer possible locating manufacturers free building sites and exemption from taxation, should such locating industry employ a reasonable number of hands. Full information along such lines will be fully, frankly and cheerfully supplied on application by the Secretary of the Board of Trade, Fenelon Falls, Ont. Fenelon Falls is THE place to spend your summer vacation if you want Health, Happiness, Good Bathing, Good Boating and Good Bass Fishing.

The Electric City—Peterborough

A MOST interesting point on the Trent Waterway is the City of Peterborough, with a population of 18,000. It is the only City on the Waterway, and is one of the most prosperous, progressive and attractive places in the Dominion. The growth of the City, especially in the last few years, has been rapid, owing to the industrial development that has taken place; and in attractiveness and beauty it has kept pace with its expansion and increase of population. The basis of the growth of Peterborough is the fact that it has all the essentials and accessories for manufacturing and distributing, and in this respect it has advantages that are not excelled anywhere. The essentials for a manufacturing centre are:

Cheap electric power and plenty of it.
Shipping facilities for reaching all markets.
Suitable sites for industries.
And good labour conditions.

Of electric power, developed from the water powers on the Otonabee River and other waters, Peterborough has an abundant supply. Several of these power sites have been developed and others are being developed, and as fast as it may be called for 30,000 horse power of hydro-electric power can be supplied. This abundant supply of power is furnished delivered to the user for power purposes at very low rates—so low as to be most attractive to manufacturers.

The shipping facilities are unexcelled. The City is situated between the two commercial centres, Montreal and Toronto, and is on the line from the Georgian Bay, which means the Northwest, to the seaboard, and is in a central location for reaching all the best markets. It has both the Canadian Pacific and Grand Trunk Railways. The Grand Trunk branches out in four different directions from the city, and besides being on the main line of the Canadian Pacific Railway between Montreal and Toronto, it is also on the Canadian Pacific line to the Georgian Bay. It has thus direct connection with all parts of the Dominion. The Trent Waterway also gives water communication, as is described in this publication.

The number and diversity of the industries in Peterborough makes labour of all kinds easily obtainable, and labour troubles are unknown. The workmen are largely home-owners and interested in the welfare of the city. Owing to expenses being lower than in the larger centres, the cost of labour is lower, which is a great advantage to the manufacturer.

Possessing these essentials for manufacturing and distributing, Peterborough also has excellent systems of sewers and waterworks, electric street railway, several large and fine parks, handsome churches and public buildings, a number of well-equipped public schools, Collegiate Institute, and Provincial Normal School, first-class mercantile establishments, three hospitals, theatres, a fine class of hotels, most efficient fire protection—all the conditions for business, health, comfort and pleasure.

The summer resorts adjacent to Peterborough are celebrated ones, including Stony Lake, with its picturesque islands, Chemong Lake, with its beautiful park, and the Otonabee River and Rice Lake, with their numerous attractive resorts.

These advantages of situation given by nature, and the acquired advantages that have been secured, [illegible] Peterborough passing all the other towns in its district in the race for advancement. Its manufacturing industries are numerous, including The Canadian General Electric Company's works in which about 2000 employees are engaged, The Quaker Oats Mills, The British Carpet Factory, whose parent factory is in England, and woollen mills, lock factory, tool factories, makers of mill, mining and hydraulic machinery, agricultural implements, locks and builders' hardware, harness and saddlery, stoves, boats of all kinds, [illegible] and paper, rope and cordage, gasoline engines, lumber, brick, furniture, cereal products, steam engines and pumps, show cases, [illegible], pork products, and many other lines. Altogether there is $12,500,000 of capital invested in manufacturing in Peterborough, and the annual production of the industries aggregates $12,900,000. Frequent enlargements are emphatic evidences of the prosperity of the industries. Wholesale houses, of which there are several, testify to the city's advantages as a distributing centre.

The many superior advantages of Peterborough are open to new industries, and enquiries will be willingly answered and information cheerfully given, and every effort will be made to facilitate their establishment. For additional intelligence on any point, or for specific information bearing on any line of manufacture, write to the City Clerk, and prompt attention will be given.

Trenton

BESIDES being the southern outlet of the Trent Canal, Trenton is conspicuous for its many natural advantages. For many years the citizens of Trenton have looked forward to the development of the water power on the Trent River. In a small way the Trenton Electric and Water Company have for a number of years developed a limited quantity of power at the Town [illegible] dam, while the Gilmour Door Company also developed sufficient power at the same dam for their own use.

During the last couple of years the Electric Power Company has secured the practical control of all the powers on the River from Healey's Falls to Trenton, and it is estimated that their total development will exceed 100,000 horse power. This Company, with its network of transmission wires, has covered the Central Ontario district thoroughly and has acquired many of the local lighting and power plants in the towns and villages between Oshawa and Kingston.

Last January an excellent Council was elected, and as a result of their efforts and with the assistance of an energetic Board of Trade, Trenton has advanced further commercially than ever before. The Council and Board of Trade of [illegible] will long be remembered as having assisted most materially in bringing Trenton's advantages before the people of Canada and the United States.

Cheap power has, of course, been the magnet which has attracted many of the new industries to Trenton. Power at $15.00 per H. P. twenty-four hours' service, delivered at the consumer's terminals, is certainly a drawing card. The Town of Trenton has at the rate 1000 H. P. to dispose of, having, in return for a lease of the power rights at Dams 1 and 2 to the Electric Power Company, accepted this amount of power as part of the [illegible]. The Trenton Electric and Water Company has now available for Trenton users 11,000 horse power, and upon the completion of Dam No. 2 will have to dispose of 20,000 H. P.

Of all the towns along the Canal, Trenton promises the greatest development, because it has the added advantage of being on the deep waters of Lake Ontario, and being served by more railways than any other town in Ontario. Trenton can offer great facilities for shipping by rail. It is the junction of the Grand Trunk and the Central Ontario Railways. This latter road is part of the Canadian Northern Ontario System, lately acquired, and Canadian Northern trains will be running through Trenton in July of this year. The Canadian Pacific lake shore line, now being surveyed between Toronto and Montreal, will run through Trenton. The proposed electric road between Toronto and Montreal will also traverse Trenton.

With easy access via the Murray Canal to Lake Ontario, Trenton has superior advantages as a distributing centre by water. The Richelieu & Ontario Navigation Company's Steamer "Belleville" calls regularly twice each week when on the run between Toronto and Montreal, while the large and handsome steamer of the Ontario & Quebec Navigation Company, "Alexandria," running between Rochester and Quebec, makes the same number of calls at Trenton. The "Ontario," the handsome new boat just launched at Collingwood, will also ply on the route. The steamer "[illegible]" [illegible] daily trips between Trenton and Picton, calling at Belleville and Deseronto. In addition to the passenger and package freight steamers referred to [illegible] these boats, many large freighters call at Trenton carrying chiefly coal cargoes.

In addition to being a manufacturing town of importance, Trenton is fast coming under the notice of the people of Canada as a tourist centre. Where can you find a more beautiful spot for the summer campers and cottagers than the shores which skirt the Trenton harbour? The land locked water stretch is always comparatively calm. The turbulent winds from the lake do not ruffle its surface. How many would [illegible] the fatiguing crush of a [illegible] watering place if this ideal resort were brought to their notice with one-tenth the persistency which the United States displays in keeping their places before the public. If the other transportation companies who are especially interested in this district would do as much to make its advantages known as the Ontario & Quebec Navigation Company has done, many more would come here every year.

It is fully expected that in less than two years it will be possible for small boats to ascend the Canal as far as Washago on Lake Couchiching above Orillia. To anyone acquainted with the beautiful scenery along the banks of the River Trent, the prospect of making this trip in a comfortable motor boat will be most inviting. Probably the finest black bass and pickerel fishing in Ontario is to be had in the waters of the Bay of Quinte and the River Trent.

Sports of every kind having in view the physical development of the young men of the town are freely indulged in and encouraged liberally. The boys and girls who grow up in Trenton will always look back to the days of their childhood with intense pleasure. No [illegible] town like theirs.

[illegible]

Electric Motive Power for Eastern and Central Ontario

THE most pronounced feature co-incident with the opening up of the Trent Valley Canal, and closely allied with its engineering aspect, is apparent in the recent rapid development of the electric water powers of the lands which the Canal traverses for three-fourths of its length. Rising in the remotest parts of the Highlands of Ontario, the Trent waters are collected by half a dozen important tributaries and passed [illegible] into the long chain of Kawartha Lakes, covering approximately an area of 75,000 acres, and whose mean elevation above Lake Ontario is 580 feet.

From this huge reservoir the water drops in a succession of falls varying from 6 to 75 ft. in height, and scattered uniformly along the river's course, to its outlet in Trenton.

From these water falls about 100,000 H.P. is being made available at water wheel shafts and 75,000 H.P. delivered to the industrial centres as electric energy.

The concentrated generation, control and distribution to points of demand of this very large quantity of power by the various original individual proprietary interests, was manifestly impossible. As a consequence, the exigencies of the situation evolved a single comprehensive system whose modern and standardized hydro-electric stations dot the map from Burleigh Falls to Trenton.

Connecting and radiating from the generating sources, a net work of carefully planned transmission lines covers the whole of Central Ontario from Peterborough in the north to Kingston on the east, and Whitby on the west, over which the power is distributed.

This organization of power interests is known as THE ELECTRIC POWER COMPANY LIMITED, with head offices in Toronto. Its power distribution system is almost completed and not only is every manufacturing centre in the Trent district benefiting by the cheap and steady power thus brought to its doors, but there are few villages and rural centres which as yet remain without electric light and modern electrical conveniences. This organization is furthermore giving the application of electricity to agricultural pursuits its close study with a view of still further enlarging the scope of its market and making Central Ontario the most modern and well developed community, both industrially and agriculturally, in Canada.

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REGINA, SASKATCHEWAN

FUR BEARING ANIMALS reach their greatest perfection in Canada. 40 species [illegible] there are [illegible] Canada [illegible] of deep.

BARRIE'S are both Fur Skin dressers, buy from the Trappers, [illegible] the [illegible] approved styles in Fur Garments be found.

Fur Qualities are unsurpassed
Fur Styles are exclusive
Fur Prices are exceptional

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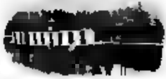

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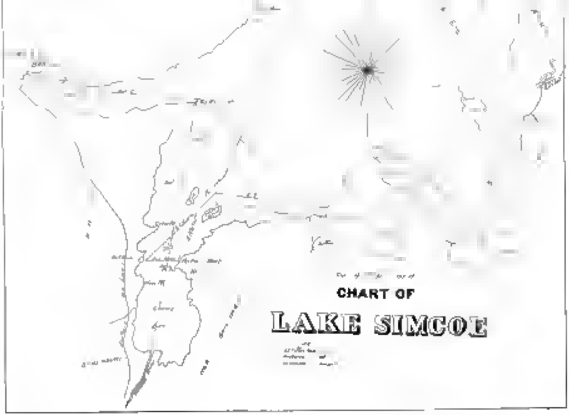
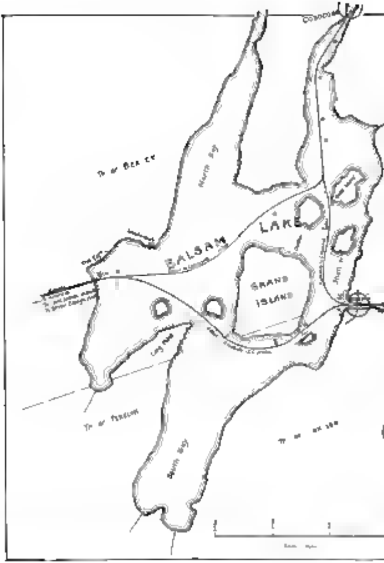
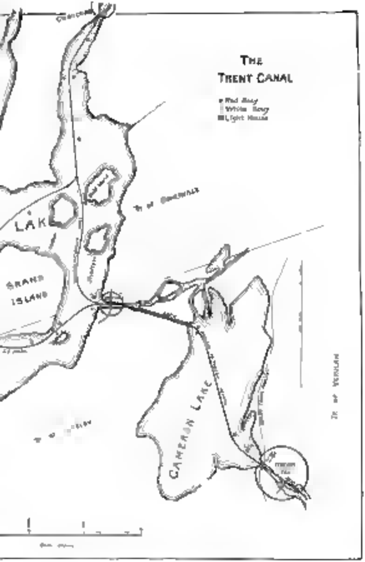
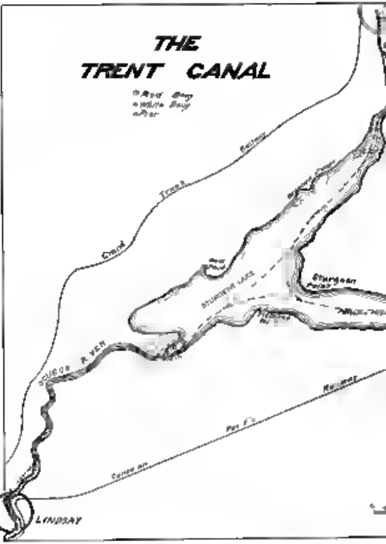


CHART OF

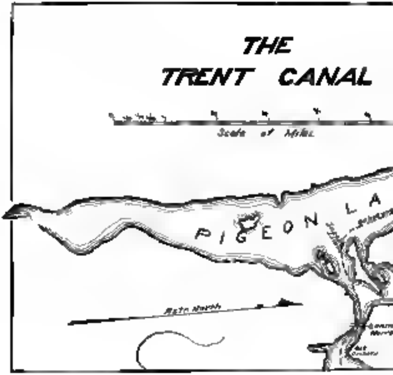
LAKE SIMCOE

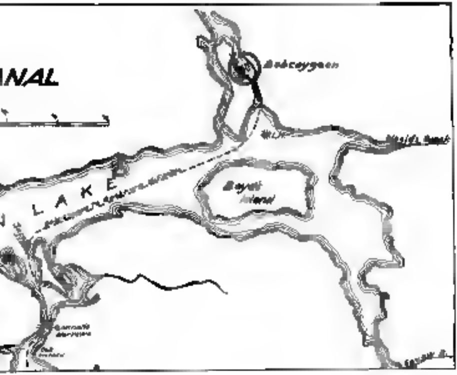

BALSAM
LAKE
GRAND
ISLAND
North Bay
South Bay
Tp. of Fenelon

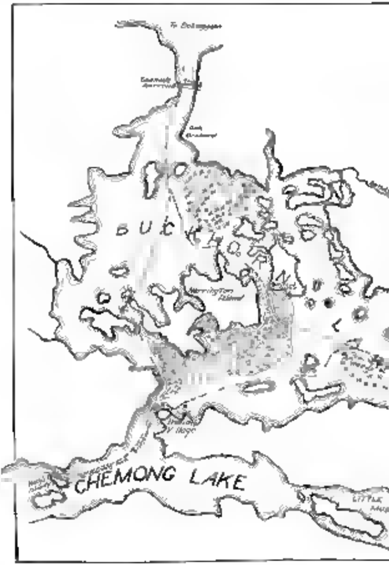

THE
TRENT CANAL
Red Buoy
White Buoy
Light House
LAKE
GRAND
ISLAND
CAMERON LAKE
Tp of Verulam

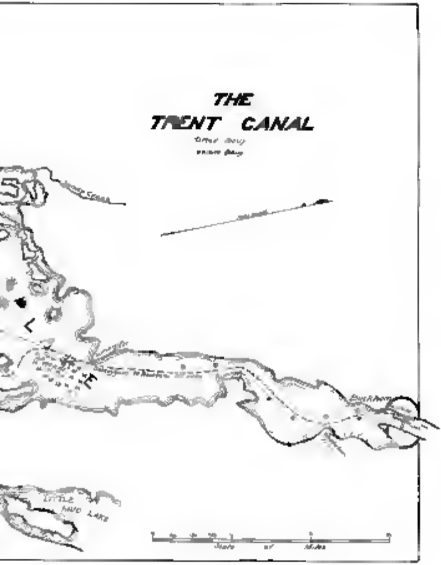

THE
TRENT CANAL
Red Buoy
White Buoy
Pier
Railway
Trent
Canal
Sturgeon Lake
Sturgeon Point
SCUGOG RIVER
Railway
LINDSAY

Fenelon
Falls
Bobcaygeon
Scale of Miles


THE
TRENT CANAL
Scale of Miles
PIGEON LA

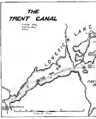

ANAL
LAKE
Bobcaygeon
Boyd Island
Nogie's Creek


To Bobcaygeon
BUCKHORN
Harrington Island
L
CHEMONG LAKE
LITTLE



THE
TRENT CANAL

Buckhorn
Little
Lake
Scale of Miles


THE
TRENT CANAL
Red Buoy
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Pier
LOVESICK LAKE
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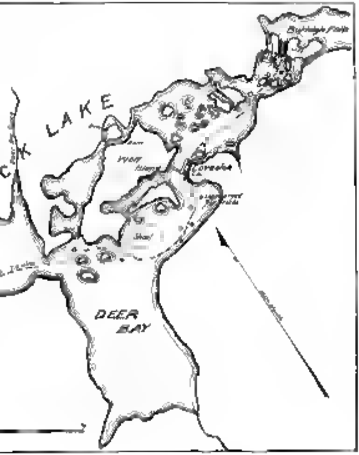
B
Blackhorn
Scale of Miles


CK LAKE
Burleigh Falls
Lovesick
Shoal
DEER BAY

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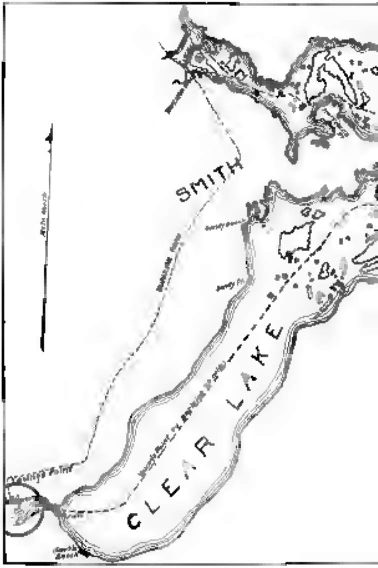
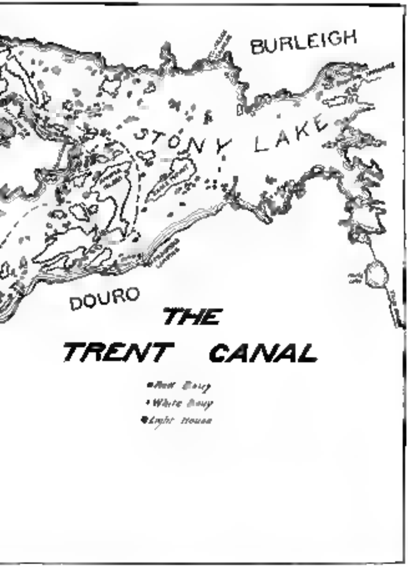

SMITH
CLEAR LAKE


BURLEIGH
STONY LAKE
DOURO
THE
TRENT CANAL
● Red Buoy
• White Buoy
● Light House

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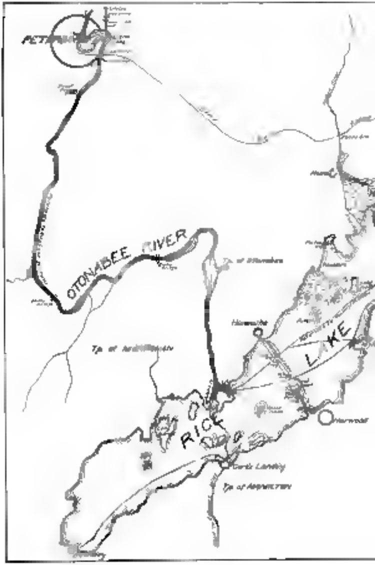
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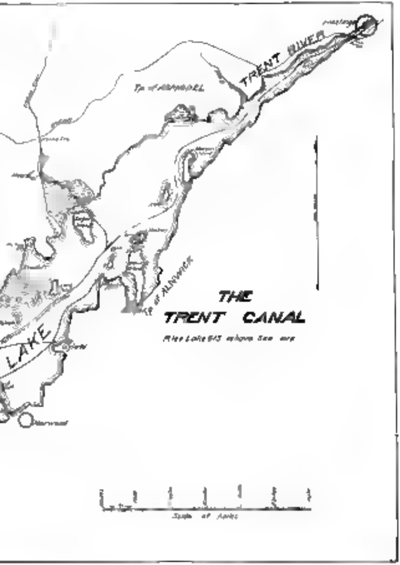
OTONABEE RIVER
Hiawatha
LAKE
RICE
Harwood
Gore's Landing


TRENT RIVER
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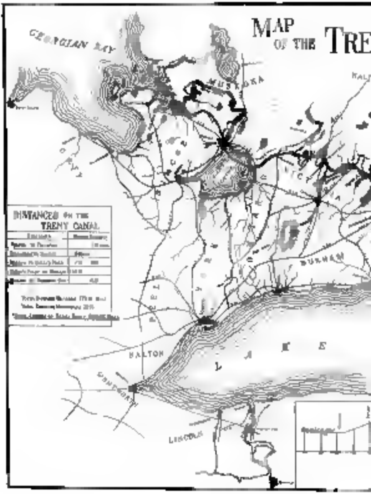
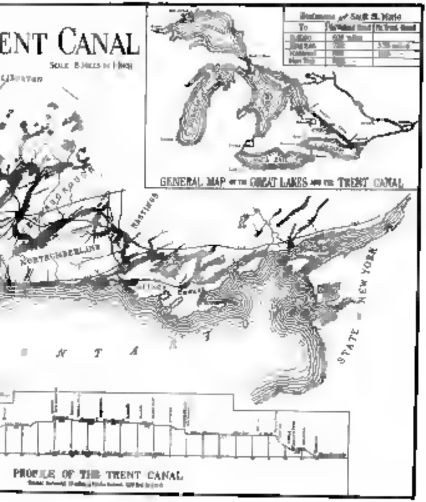
THE
TRENT CANAL
Scale of Miles


MAP OF THE TRE
GEORGIAN BAY
MUSKOKA
VICTORIA
DURHAM
HALTON
WENTWORTH
LINCOLN
L A K E
DISTANCES ON THE TRENT CANAL

ENT CANAL
SCALE 8 MILES TO 1 INCH
PETERBOROUGH
HASTINGS
NORTHUMBERLAND
N T A R I
STATE OF NEW YORK
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To
GENERAL MAP OF THE GREAT LAKES AND THE TRENT CANAL
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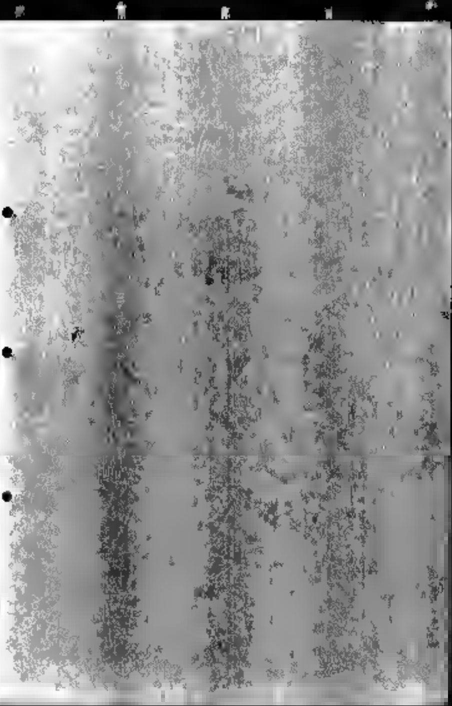

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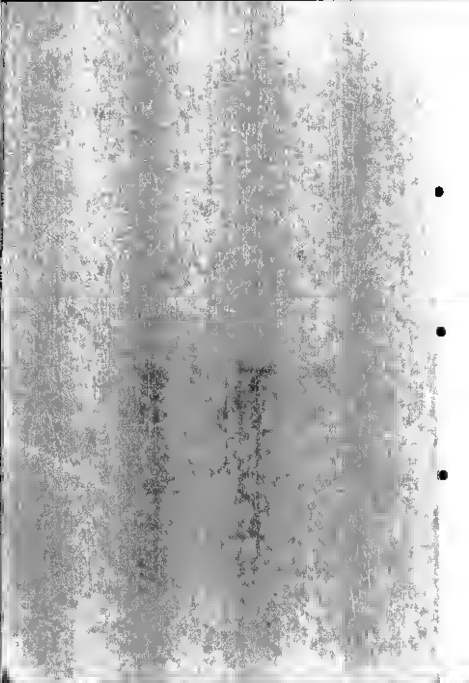

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There is no duty to pay on O'Keefe's "Pilsener"

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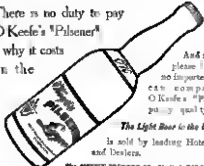

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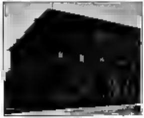

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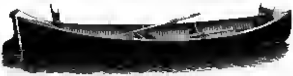

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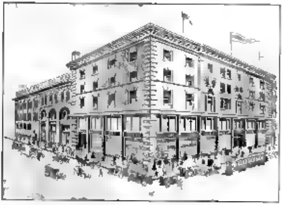

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INTRODUCTION

DURING the past few years there have been a great many requests for details of information regarding the Trent Canal. This has especially been the case since the completion of what is known as the Lake Simcoe-Balsam Lake Division, throwing open, as it did, an uninterrupted stretch of navigation of 160 miles, extending from Orillia on Lake Simcoe to Healey's Falls on the Trent River. The increasing popularity of the various lakes and rivers that constitute the Trent Canal, as tourist and summer-residence resorts, has added greatly to the number of private yachts; steamboat business has increased to large proportions, and we now have practically a through steamboat service from the Trent River to points on Lake Simcoe. With this increase in the number of yachts and steamboats has come an increased demand for charts of the navigable channel and for information regarding the Canal generally. It is, therefore, with a view of satisfying the thirst for enlarged knowledge in these respects, that this book is compiled. I have endeavoured to present herein, in as complete and condensed a manner as circumstances will permit, charts of the various lakes which will prove useful to navigators, facts concerning the early history of the Canal, and more or less comprehensive data generally concerning the position the Canal occupies at the present time, and is destined to occupy in the scheme of Canadian transportation.

I regret that at the time of the publication of this work no official charts were available in the Railways and Canals Department defining the navigation channels of the greater portion of the lakes and rivers that constitute the Trent Canal. The charts presented herein, while unofficial, are for the most part based upon the observation and experience of practical navigators, and will be found sufficiently reliable to permit of navigation with reasonable care and safety the 160 miles of Canal and connecting waters between Orillia and Healey's Falls. The chart of Lake Simcoe, however, which is herein published, is absolutely authentic, and should be found invaluable to vessel owners on Lake Simcoe.

E. S. CLARRY

MADE THE FIRST TRIP

THAT the route of the Trent Canal, via the Severn and Trent Rivers, was a recognized channel of water communication between Lake Huron and Lake Ontario, by the Indian tribes of centuries ago, is a well known fact. The Huron Indians, who resided along the shores of Lake Huron and Lake Simcoe, were undoubtedly familiar with this comparatively short water route to the Bay of Quinte. After paddling across Lake Simcoe and up the Talbot River for some little distance, they portaged across to Balsam Lake, the summit waters between Georgian Bay and Lake Ontario. Hence, we to-day have running across from Lake Simcoe to Balsam Lake what is known as the "Portage Road." It follows the same trail that was used by the Indian tribes of several hundred years ago.

Champlain, the French explorer, was the first white man to come down from Lake Huron to Lake Ontario, by way of what was to be known nearly three hundred years later as the Trent Canal. This was in the year 1615. The story of Champlain's trip over these waters as told by Francis Parkman in his history, "Pioneers of France in the New World," is most interesting. Champlain had gone up the Ottawa River and portaging over to Lake Nipissing came down the French River into Lake Huron. His expedition down through the Lakes and Rivers that now constitute the Trent Canal, is best told in the historian's own words.

At the outlet of Lake Simcoe they all stopped to fish,—their camp's substitute for a commissariat. Hence, too, the intrepid Etienne Brulé, at his own request, was sent with twelve Indians to hasten forward the five hundred allied warriors—a dangerous venture, since his course must lie through the borders of the Iroquois.

He set out on the eighth of September, and on the morning of the tenth, Champlain, shivering in his blanket, awoke to see the meadows sparkling with an early frost, soon to vanish under the bright autumnal sun. The Huron fleet pursued its course along Lake Simcoe, across the portage to Balsam or Sturgeon Lake, and down the chain of lakes which form the sources of the river Trent. As the long line of canoes moved on its way, no human life was seen, no sign of friend or foe; yet, at times, to the fancy of Champlain, the borders of the stream seemed decked with groves and shrubbery by the hands of man, and the walnut trees, laced with grape-vines, seemed decorations of a pleasure-ground.

They stopped and encamped for a deer-hunt. Five hundred Indians, in line, like the skirmishers of an army advancing to battle, drove the game to the end of a woody point; and the canoe-men killed them with spears and arrows as they took to the river. Champlain and his men keenly relished the sport, but paid a heavy price for their pleasure. A Frenchman, firing at a buck, brought down an Indian, and there was need of liberal gifts to console the sufferer and his friends.

The canoes now issued from the mouth of the Trent. Like a flock of venturous wild-fowl, they put boldly out upon Lake Ontario, crossed it in safety, and landed within the borders of New York, on or near the point of land west of Hungry Bay.

The First Survey

It is now 78 years ago since the first survey was made of the proposed route of the Trent Canal. Twenty-four years ago the project was discussed at considerable length in "Canadian Pamphlets," and a review of the efforts of the people of the Trent District to have the scheme carried to a successful issue [illegible] as interesting to-day as it no doubt was at the time. In reading the extracts here taken from "Canadian Pamphlets," it will be observed that the Georgian Bay-Ottawa River Canal scheme was a live issue of the [illegible] as it is to-day—but it looks certain that [illegible] the [illegible] of construction the Trent Canal, although a great many years on the way, will carry vessels from Georgian Bay to Montreal before the large scheme of the Ottawa River route is more than actually commenced. "Canadian Pamphlets," a publication of 1857, says:—"In the year 1833 the project of connecting the waters of Lake Simcoe with those of Ontario by means of a Canal passing through Rice Lake and the Bay of Quinte was generally discussed, and received the attention of the Government. Mr. N. H. Baird, Civil Engineer, was appointed by His Excellency Sir John Colborne to make a survey of the waters connecting these two Lakes with a view of deciding upon the eligibility of the route for that purpose. He entered upon the work in 1833, and in the year completed the survey of the Trent and Otonabee Rivers. Having received further instructions he resumed his survey in 1835, and continued it from Peterborough via the Otonabee, and back waters to Lake Simcoe. The report of these surveys was exceedingly favorable. The estimates for the works made the entire proposed cost of opening up an uninterrupted water communication between the Bay of Quinte and Lake Simcoe, a distance of about 165 miles and 706—4 feet of lockage, £496 [illegible]."

Mr. Baird, however, appears to have feared that the amount of the estimate might deter the Government from prosecuting the work, to which he attached very considerable importance. He therefore made the suggestion that only the least expensive sections of the Canal should be at once proceeded with and the other portions railwayed. "In which," says the report, "[illegible] rather remarkable, the whole ground of these intermediate sections afford the most favourable opportunity for construction that can be imagined or wished for, any descent that is being in the proper direction and easy of construction." The estimate of the probable expense of forming a connection between Lake Simcoe and the Bay of Quinte, on the double principle of railway and canal, was £165,586.

The objection of transhipment, an almost inseparable one with the double scheme, Mr. Baird proposed to get rid of thus: "With the view of doing away with the only, at least the chief objection to the expedient system—the idea of frequent transhipment—I would propose that long and substantial steamers of particular construction should regularly ply to and from on the intermediate water communication, and so constructed as to admit of the train of cars being transported at once with their loadings, direct either for Lake Huron or Lake Simcoe, as the case may be, and which I am satisfied can be done in such a way as to be practically useful and serve well the present, and until such time as it may be deemed proper to put the lockage system in execution the prospective wants of the country."

This project, great as was the interest which attached to it at the time, was never carried out. Some £90,000 odd was expended upon the River Trent work, and the lock at Peterborough basin proposed by Mr. Baird was constructed, but the troubles of 1837-38 and the changes which immediately succeeded prevented the full execution of the project of connecting the waters of Lake Simcoe with the Bay of Quinte. The necessity for such a work, however, has never been lost sight of. Within the last two or three years the project of connecting the waters of Huron with those of Ontario, or the St. Lawrence, with a view of directing the immense and growing trade of the Western States through Canadian channels—its natural outlet—has engaged the attention of the people and press, not only of Canada, but of

[illegible]

Chicago and the Western States. Two projects to that end are before the public: the one to connect the Georgian Bay with the City of Toronto, preliminary surveys of which have already been made, showing it to be a work of great, though by no means insuperable difficulties; and the other to connect Lake Huron with the Ottawa, a project to which Mr. Walter Shanly, one of our ablest Provincial Engineers, has given his adhesion. But it is quite evident that neither of these schemes, important as they unquestionably are, can for a single moment compare with that projected in 1833, to which reference has been made. The first, in addition to the immense expense of the work, $25,000,000.00, owing to the heavy cuttings that require to be made and the great engineering difficulties that must be surmounted, offers but problematical advantages as a national work. That it would prove of very great advantage to the City of Toronto, and divert much of the western trade through that city, is undoubted; but when that has been said, the main argument has been advanced that can be advanced in its favour. It opens up no new country, and the produce once in Ontario through Toronto, stands equal chance of finding its way to the Atlantic through American as through Canadian channels. The second proposal, that of connecting the waters of Lake Huron with those of the Ottawa, stands deservedly high as a national enterprise. If constructed it would open up an immense section of country now absolutely useless, and it would have the effect of placing Canadian channels far before any other for the conveyance of the produce of the west to the markets of Europe; advantages which cannot be overlooked in the construction of this national work. But the heavy outlay required on such a work is likely to retard its completion for many years. The route via Peterborough and the Trent, while offering advantages almost equal to those of the Ottawa Canal, as regards the opening up of the country and the development of trade by the St. Lawrence, is so much less expensive as to offer much greater prospect of immediate construction. The advantages of the Trent route were thus epitomized in a letter recently addressed by W. S. Conger, Esquire, to the Chief Commissioner of Public Works:

First.—It is shorter and more direct than any other, except the Toronto and Georgian Bay which, from its great cost, may be set down as impracticable, from Chicago and the Sault Ste. Marie to the seaboard, whether via Montreal and Quebec, or Portland or New York.

Secondly.—It passes through a rich and fertile country, and presents fewer engineering difficulties, and could therefore be constructed for a much smaller amount than either of the other proposed routes.

Thirdly.—Being at least two degrees further south than the Ottawa route, it would have the advantage of being open for two or three weeks longer every season.

Fourthly.—Its terminal harbours would be large and commodious, particularly that at the mouth of the Trent—having on one side the Bay of Quinte, and on the other, by a short and comparatively inexpensive cut, the Presqu'ile Bay—the safest and most commodious harbour on Lake Ontario, thus affording an easy and safe entrance to Trenton from Lake Ontario and the River St. Lawrence.

The advantage of the Trent River in point of distance may be estimated by the following figures:

From Chicago to New York via Buffalo and Erie Canal	[illegible] miles
From Chicago to New York via Welland Canal and Oswego	[illegible]
From Chicago to New York via Huron, Nipissing, Ottawa & Caughnawaga Canal	[illegible]
From Chicago to New York via Georgian Bay, Valley of the Trent and Oswego	1,232
From Chicago to Montreal via Lake Nipissing	[illegible]
From Chicago to Montreal via Georgian Bay and Valley of the Trent	1,003

It will thus be seen that in point of distance to New York, the Trent route has the advantage over the Nipissing and the Ottawa route by [illegible] miles. While between Chicago and Montreal the distance is in favour of the Ottawa route [illegible] miles, an advantage, however, more than over balanced by the intricate and difficult navigation of the latter.

But the pages of a work like this are hardly the place wherein to discuss this subject and the reader is therefore requested to regard the remarks relative to the merits of the different Canal schemes now before the public as parenthetical in their character.

Such was the position of the various Lake Huron-Lake Ontario canal schemes as viewed by a Canadian Pamphleteer in the year 1857.

Snow

Started By Imperial Government

AS has already been stated, the locks just below the City of Peterborough and the locks at Hastings, on the Trent River, were built in the year 1837 or thereabouts. The construction of these two locks was the first step in a practical effort to connect Georgian Bay and Lake Ontario by means of this route, and they were built by the Imperial Government. As a matter of fact, a lock was also built at about the same time at Glen Ross, better known perhaps to many as Chisholm's Rapids, about 24 miles above the town of Trenton. Why Chisholm's Rapids was selected as one of the most important points to build one of the first locks on the system few, we venture to say, can even imagine, as it did not afford any local benefit, nor did it throw open any substantial additional stretch of navigation. Its gates never opened to greet a friendly vessel, its gray limestone walls never re-echoed to the sound of the steamer's whistle, and for 70 years or more it stood as a monument to the enterprise of the Imperial Government. The lock at Chisholm's was demolished only a year or two ago, to make room for the substantial and modern concrete lock, which is already completed, and which is one of the 18 locks now being built on the Ontario-Rice Lake section of the Canal. The lock at Hastings, which afforded a means of navigation from Healey's Falls to Peterborough, a distance of 53 miles, remained in commission until one year ago, when it was closed and demolished, to be replaced by a more modern and much larger one. The lock at Peterborough has been deepened since its original construction, but its walls are about the same as they were when first built.

Other locks had been built at several points, but their construction was more with a view to meeting the requirements of local interests, rather than with a view to a scheme of through navigation. In fact, as far back as the year 1835 a lock was built by the "Inland Water Commission" at Bobcaygeon, which afforded a means of navigation from Sturgeon Lake to Pigeon, Buckhorn and Chemong Lakes. In the year 1837 the construction of a lock was commenced at Lindsay on the Scugog River, and it was placed in commission in the year 1843. It opened a stretch of navigation to Port Perry and other points on Lake Scugog. In 1850 a wooden lock was built at Rosedale, connecting Balsam and Cameron Lakes, and about the same date the building of the present lock at Young's Point was undertaken. When completed a few years later it afforded navigation for vessels between Lakefield and Burleigh Falls and other points on Stony Lake.

However, the idea of connecting Lake Huron and Lake Ontario by means of a canal through the Trent Valley was by no means dead. The interest taken in the project by Sir John Colborne, Lieutenant-Governor and afterwards Governor-General, had induced many settlers from the Old Country to establish themselves on these waters, and the subject came up for discussion and renewed attention at intervals. About 1858 Mr. W. S. Conger, M.P. for Peterborough, called attention anew to this great route for transportation, and subsequently advocated its construction by appeals to the Government and by speaking constantly of its merits in the House and in the press. Nothing was done at the moment, but in 1867, at the time of Confederation, the British North America Act reserved the works on these waters and their control for the Dominion of Canada, contemplating the completion of the project.

Soon after 1870 Mr. Mossom Boyd, of Bobcaygeon, took up the matter, accumulated much information, and by his energetic advocacy stimulated renewed discussion in the press. He obtained a charter for its construction as a private enterprise, and even proceeded to London to secure the interest of capitalists, but circumstances at that time were not propitious and he was not successful in his efforts.

In 1878 the question was again brought up in a new light. The Ontario Government obtained from the Mackenzie Administration a transfer to them of the works on the Trent, and this was strongly opposed in the local press, as giving up property expressly reserved at Confederation and virtually abandoning the idea of ever opening the Trent Waterway for transportation. The opposition leaders supported this view, and when they in turn succeeded to power they rescinded the order-in-council making the transfer. In the years 1879 to 1881 considerable survey work was done with a view to proceeding with the construction of the Canal. Mr. David Starke, C.E., and Mr. Tom S. Rubidge had been in that interval engaged in the work. Mr. Thos. D. Belcher became Superintending Engineer.

The agitation by the people of the Trent Valley district broke out pretty strongly about the year 1880, and by the year 1883 contracts were let by the Dominion Government for the construction of the locks at Fenelon Falls, Buckhorn, Lovesick, and Burleigh Falls. About 1887 these sections were thrown open for navigation, completing an inland stretch of navigation from Balsam Lake to Lakefield. About the same time the demand for the completion of the Canal became stronger and more emphatic than ever. Trent Canal Associations were organized, deputations representing the entire district from Midland to Trenton visited Ottawa, red hot newspaper editorials were handed out, and oratory with a vengeance and a Canal flavor was to be heard at public meetings.

Mr. Thomas Rubidge, one of the Government Engineers in charge of the work, was accused of being lukewarm on the project, and a glance at the report and estimates made by him on the proposed work would certainly go to show that he was not bubbling over with enthusiasm for the completion of the Canal. The Government of John A. Macdonald finally decided to appoint a commission to enquire into the merits of the proposition. This announcement was not very enthusiastically received by the friends of the project, who felt that the feasibility of the scheme, as well as its necessity, had been long ago established. However, the commission was appointed in 1887. It was composed of Messrs. Judge Weller, Peterborough, John Kennedy, C.E., Montreal, and Frank Turner, C.E., Toronto. They were to consider the question of further extending the line of water communication between Lake Huron and Lake Ontario, and to determine whether it is advisable that an extension of the main work should be undertaken, and if so, to what extent, and under date of December 17th, 1890, these Commissioners, after personally going over the route, taking evidence at various points, including Kingston, Montreal, Albany and Buffalo, reported:

"In considering the bearing of the Canal upon the development of the trade and natural resources of the country through which it will pass, it should be noted that the conditions are peculiar, inasmuch as it would act as a connecting link in a chain of lakes and streams which for the most part lie transversely to the line of the Canal, and that it would therefore afford access to an extent of country and coast much greater than usual in a Canal of its length.

"The Commissioners, upon the evidence and information which they have been able to obtain, and which accompany this report, are of opinion that an extension of the main work should be undertaken by the completion, as soon as convenient and practicable, of the work necessary to give continuous navigation from Balsam Lake to the Bay of Quinte. This would embrace the sections between Lakefield and Peterborough and between Healey's Falls and Trenton. In the opinion of the Commissioners a waterway would thereby be made which would not only increase the value of the works already constructed, but would assist and develop the industries along its route, and open up the resources of the country through which it would pass to such an extent as to amply compensate for the expenditure necessary to be incurred, although the work itself would not be expected to produce direct revenue.

"This conclusion is arrived at by a careful consideration of the evidence adduced before the Commission, by which the Commissioners feel they must be guided, such evidence to their minds greatly preponderating in favor of the extension of this important work in the manner indicated."

Although the Commission reported favorably to the completion of the Trent Canal in December, 1890, and although strong pressure was brought to bear upon the Government of the day to have new sections undertaken, it was not until 1896 that any move was made in the matter. Contracts were, in that year, let for the construction of the division extending from Lake Simcoe to Balsam Lake, and for the Peterborough-Lakefield section. One of the contracts on the Peterborough-Lakefield section included the construction of the Peterborough Lift Lock, while the Kirkfield hydraulic lift lock was included in one of the contracts of the Lake Simcoe-Balsam Lake Division. The Peterborough Hydraulic Lift Lock was opened in June, 1904, and the Kirkfield Hydraulic Lift Lock in July, 1907, thereby throwing open a stretch of navigation 160 miles in length, from Orillia to Healey's Falls.

The Peterborough-Lakefield Division and the Balsam Lake-Lake Simcoe Division were both under the supervision of Mr. R. B. Rogers, M. Can. Soc. C. E., who from 1896 to 1907 was Superintending Engineer of the Trent Canal. When it was first suggested that hydraulic lift locks should be built on the Trent Canal, Mr. Rogers was instructed by the Department to proceed to Europe with a view of studying the matter of lift locks and their uses and report to the Department the result of his investigations. Mr. Rogers made the trip, gave the subject thorough investigation, acquired a large fund of information, having inspected three European locks in operation, and reported favorably to the feasibility of hydraulic lift locks on the Trent Canal. Mr. Rogers was in charge for the Government of the construction of both hydraulic lift locks.

In the year 1907 the Government decided to finish the southern outlet of the Canal. Accordingly in August of that year, the first contract on the Ontario-Rice Lake Division was let. The work on this Division is dealt with elsewhere.

[illegible]EW OF LOCKS YOUNG'S [illegible]

ENTRAN[illegible] [illegible] PETERBOROUGH LOC[illegible] [illegible]

Ripon

A Toronto View in 1887

IT has been mentioned elsewhere that the Trent Canal scheme has at times received very little support from a certain section of the Canadian press. The friends of the Trent Canal declare this to be especially true regarding the press of the City of Toronto. It must, however, be noted in all fairness to the press of the province generally, that a more friendly interest has been displayed in the project during the past few years. That at least one Toronto daily paper had little faith in the scheme as a means of through navigation as late as the year 1887 may be seen from the following editorial from the Toronto Mail of October 14th of that year:

The announcement that a commission has been appointed by the Dominion Government to enquire into the advisability of proceeding with the construction of the Trent Valley Canal suggests the fact that that great public undertaking has enjoyed, on paper, an extended and somewhat chequered career. The Canal was proposed in the year 1827. It is, therefore, after sixty-one years of discussion regarding it, for it has been trotted about at every election time, the authorities have concluded that they are not quite sure the public requirements demand it. Delay, however, may not be fatal to the enterprise. Canal projects die hard, as witness the struggles of the Huron and Ontario Canal. Moreover, they have a habit of reviving just when it is supposed their last hour has come. The Murray Canal, for example, was proposed in the year 1797. Interest in it waxed and waned until 1880 or thereabouts, when, though everybody supposed the enterprise had collapsed, a contract was suddenly let for its construction. It was proceeded with much to the political advantage of the Government of the day, and is now an accomplished fact.

The original Trent Valley Canal proposition was not so extensive a scheme as that of to-day. The idea of its projector was merely to furnish a route by water from Lake Ontario to Lake Simcoe. The region in the neighborhood of Lake Simcoe was the Northwest of that period, and people were anxious to open it up for settlement and for trade. It was not until 1833 that the Canal was reported on by an Engineer, and it was then declared that two million dollars would complete it. It was at once resolved to proceed, but the work did not commence until 1837. For two years operations proceeded vigorously. In 1839, however, there was a stringency in the money market during which the cash borrowed for the Canal was diverted to other projects, and as a result the contractors abandoned the work. In 1841 an attempt was made to revive interest in the scheme and to enlarge it so that it might provide a through system of navigation from Lake Ontario to the Georgian Bay. But the Board of Works reported that as a through line the Canal would not be successful, owing to the great lockage required and the limited draft of water of vessels which could be used on the route, and that for purposes of local traffic it would not be a success, because the route, through its greater part, was extremely circuitous. The estimated cost of the Canal was placed at $3,600,000.00, and it was suggested that instead of starting so large an outlay, the works already undertaken should be completed and used as timber slides. This plan was adopted, and the cost of the work up to the year of Confederation was $670,078.00. From Confederation on it has been impossible to convince successive Governments that a through Trent Canal is practicable. The first Conservative Government took little stock in the project, and the Mackenzie Government, after an effort to take over and carry on the works had failed, passed the whole affair, locks, dams and slides, over to the Ontario Government. The transfer having been accomplished just two days before the Reform Government went out, it was claimed that the object was to destroy the dams, rescue several thousands of acres of land which had been submerged for years, and in fulfilment of a campaign promise, distribute them through the Ontario authorities among certain favourites in the various constituencies along the route. This accusation was stoutly denied, and it was stated very positively that the works were passed over to Ontario because they were merely timber slides, and because the Government had resolved not to complete them with a view to the establishment of a through system of navigation.

In 1870 the Dominion re-assumed the works, and it has them still. The authorities have from time to time expressed opinions and adopted measures which have led the residents of the Trent Valley district to believe that the Government seriously intends to build the Canal. In the 1882 election this belief helped the Conservatives in Central Ontario counties, but in 1887 it was not potent, not because the Conservatives had altered their plans, but because the Reform candidates professed to be as anxious as any person could be that, despite the expense, the Canal should be built. In future contests the politicians in the district through which the projected work will run will no doubt vie with each other in their pledges of devotion to the interests of the Canal. The result will be that the work will be forced upon the party leaders, although it is almost a certainty that none of them approve of it.

[illegible]

[illegible] RIVER

[illegible] STONEY LAKE

The Present State of Canal

At the date of the publication of this work the extent of the finished portion of the Trent Canal is 150 miles, the distance from Washago, ten miles above Orillia, to Healey's Falls, now available for navigation by vessels of 6½ feet draft. There is, however, in addition to this, a considerable extent of natural navigation for the draft mentioned, by which side trips might be taken, such as to the picturesque town of Barrie on Kempenfeldt Bay, on the western side of Lake Simcoe; to Jackson's Point, on the south shore of Lake Simcoe; and to Lindsay on the Scugog River, continuing further down the stream to Port Perry on Scugog Lake.

After more than seventy years of a chequered career, it now looks as if the Trent Canal as a means of through transportation from Georgian Bay to Lake Ontario will be an accomplished fact within the next four or five years. At the present time the entire division from Healey's Falls to Trenton is under contract, and the work is being advanced with vigour by the various contractors. The fact that the Dominion Government has this year set aside the sum of $1,750,000 for construction work on this division shows that the energetic policy decided upon with respect to the early completion of the Canal will be carried out with the least possible delay. As a matter of fact it is regarded as extremely probable that several of the above mentioned contracts (there are seven in all) will be finished by the end of the present year. The contract for the section of Canal in the vicinity of Campbellford, which has been awarded to Messrs. Haney, Quinlan & Robertson, is the heaviest undertaking on this division, and it may be two or even three years yet before it is completed, and before boats may be able to travel from the land-locked waters of Lake Simcoe to the broad expanse of Lake Ontario.

It should be mentioned also that the locks, now under construction on the division extending from Trenton to Healey's Falls, and in fact extending up to Peterborough, are being built so as to provide for an 8 ft. 4 inch draft. This will accommodate barges of 1,000 tons. It is intended that ultimately the entire Canal will be deepened to accommodate vessels drawing 8 ft. 4 inches of water, with a minimum depth of nine feet between the locks.

However, even with the completion of the work at present under contract between Healey's Falls and Trenton, through navigation will not be afforded from Georgian Bay to Lake Ontario. There is yet to be placed under contract the section extending from Lake Simcoe to Georgian Bay, a distance via the Severn River of 30 miles. The work on this section of the Canal is not considered very heavy, consisting of the building of five or six locks and dams. The advocates of the early completion of the Trent Canal are hopeful that the Government may place this section under contract within the next twelve months, so that it may be finished concurrently with the Healey Falls-Trenton Division (officially known as the Ontario-Rice Lake Division), thereby completing within the next few years, a Canal that will afford a water route from Sault Ste. Marie to Montreal shorter by 200 miles than that by the Welland Canal.

The Ontario-Rice Lake Division

IN the annual report of the Department of Railways and Canals for the year ending March 31st, 1910, being the latest annual report of the Department to hand, is found some very interesting information concerning the nature of the work that is now in progress in making the Trent navigation for vessels of 6 feet 4 inches draft, then completing the southern outlet of the Canal. Mr. A. J. Grant, Superintending Engineer, who is in charge of the work, says:

This division embraces the fifty-six and a half miles of all river route between Trenton on Lake Ontario and Rice Lake, which will comprise when completed nine and a half miles of canal, thirteen miles of submarine channel, and thirty-four miles of deep river, whose average width will be about 500 feet. The rise between extreme low water level of Lake Ontario and normal navigation level of Rice Lake is 360 feet, which rise will be overcome by 18 locks ranging from 6 to 27 feet in height. Fourteen concrete dams, with stop-log sluices, will be required for the regulation of the river, and at them 75,000 h.p. gross may reasonably be developed at the low water stage of the river, but this quantity may be increased somewhat by a large expenditure on tail race excavation. The normal navigation level of the natural reaches of the river and Rice Lake will be that of ordinary summer level, so that practically no damage will be done by flooding the land along the river and lake shores. In the rapids the dams will hold the water at as high a level as practical, which, in the majority of cases, will be lower than the top of the river banks. The canals and channels with sides showing above water will have a minimum bottom width of 80 feet, except in two cases of short canals above locks where the bottom width will be only 60 feet, and the submerged channels will have a minimum bottom width of 100 feet, which will be marked at frequent intervals by small piers. The canals and submarine channels will have a depth of 8 feet.

There will be sixteen bridges, ten of which will be for highways and six for railways. They will all be swing or bascule spans, except that for the main line of the Grand Trunk Railway at Trenton Junction, which will be a high level fixed bridge, under which there will be a clear head room of 27 feet at a stage of high water in Lake Ontario.

The locks will be of concrete and will have 8 feet 4 inches of water on the sills, with chambers 33 feet wide by 175 feet long between hollow quoins. They will accommodate barges of 1,000 tons, whose size will be about 150 feet long by 30 feet beam, and drawing 6 feet of water. Entrance piers of not less than 150 feet in length will be provided above and below each lock. The locks will be filled through culverts 4 feet wide by 5 feet high in the side walls, which will be equipped with wagon valves for controlling the water. The lock gates will be of the mitre timber type and the upper gates in all cases will be set on the top of lift walls. They will be operated by struts or bars working in hand power winches set in recesses, which will be formed in the lock walls.

The total cost of the improvement of this part of the Trent Navigation will amount to about $6,750,000, the first vote for which was made by Parliament during the session of 1907. The project involves the removal of about one and a half million cubic yards of earth, one and a quarter million cubic yards of loose and solid rock, and the building of about four hundred thousand cubic yards of concrete.

As to The Future

THE advocates of the construction of the Trent Canal as a means of through navigation from Lake Huron to Lake Ontario are to-day more than ever convinced that when the waterway is completed it will be an important factor in the grain carrying trade between the great west and the Atlantic seaboard. While it has, up until a few years ago, received very little support from the large industrial centres of Canada situated upon its route and which may not derive any immediate benefits from its completion, it is to-day, with the great increase of wheat production and transport necessity, generally speaking, receiving the hearty support of every section of the Dominion of Canada. The present Minister of Railways and Canals, Hon. G. P. Graham, has displayed keen interest in the project and the work of completing the waterway has proceeded, under his administration, with greater vigor than at any time in its history. A certain section of the press of Canada, too, has at times been more or less hostile towards the project, but those who have for years fought so determinedly in its behalf are hopeful that in a few years hence they will see barges, laden with grain from the great West, passing down its course.

The old Erie Canal, with its draft of a trifle more than five feet, can hardly, in the matter of carrying capacity, be compared with the Trent Canal, with its draft of 8 feet 4 inches; yet the advocates of the Trent waterway point with pride to the part the Erie Canal has played in the transportation interests of the United States. It is pointed out that the incalculable benefits which have been derived from the Erie Canal in the past are not disputed by any one. To it, more than to any other one cause, is due the phenomenal growth and commercial supremacy of the City and State of New York. It opened up the great West to settlement, and in turn attracted the products of the West to the low grade line through the Appalachian chain which exists only in the State of New York. The tolls on that waterway have more than repaid the cost of construction, maintenance and operation; in addition, it has paid over $300,000,000.00 of freight money within the limits of the State, and the disbursement of this money along the line of the Canal has built up the great interior cities from Buffalo to Albany, forming a continuous line of commercial centres which has no counterpart in any other State. The growth of these Cities in turn led to the construction of railways paralleling the Canal and these, by consolidation and scientific management, have gradually reduced the cost of transportation with all the advantages such a reduction necessarily brings. With the completion of the Trent Canal not only will transportation rates, generally, be reduced to points along its route, but a good percentage of the grain that passes through the "Soo" Canal on its way from the West will be conveyed in barges, by way of the Trent, to Montreal and the seaboard.

One of the ablest speeches that has ever been delivered on the practicability and desirability of the Trent Canal and its possibilities as a factor in through transportation was made by Mr. R. R. Hall, who some four years ago represented West Peterborough in the Dominion House of Commons. Mr. Hall, who had given the Trent Canal and its future a most careful study, in addressing the House on the matter, amongst other things, said:

"The consumption of coal in the City of Peterborough last year was 43,430 tons. The rate on coal from Suspension Bridge to Peterborough by rail is $1.25 a ton. Coal is delivered at Oswego at 10 cents a ton cheaper than at Suspension Bridge. Freight between Oswego and Trenton or Port Hope is 25 cents a ton, and the rate between Port Hope and Peterborough by rail, though only a distance of 30 miles, is 50 cents a ton. On coal alone, the freight from Trenton to Peterborough, were the Canal completed, would not be more than 25 cents per ton. On that basis there would be a clear saving on coal to Peterborough of 75 cents a ton, or, on the amount consumed last year, a total saving of $32,500.

After dealing very exhaustively with the project, Mr. Hall concluded by saying:

When you take into consideration the fact that we have the means right in the very heart of the Province of Ontario of establishing a 750 ton barge Canal, which will have a capacity of carrying practically two and a half train loads of grain from Midland to Montreal, I think you will admit that it is a matter deserving of the most serious consideration, and that the Canal is a work which should be immediately gone on with as part of our national system of grain transportation.

It will be observed that Mr. Hall referred to the Trent Canal as a 750 ton barge waterway. Since that time the Government decided on building the new sections of the Canal with a draft of 8 feet 4 inches on the locksills, thereby providing for the use of 1,000 ton barges. The Ontario-Rice Lake section of the Canal is being built with an 8 feet 4 inches draft, and any renewals that may be made from time to time on the older portions of the Canal will be on the same scale.

[illegible] SEC[illegible] [illegible] LAK[illegible]

[illegible] HYDRAUL[illegible] LOOK [illegible] CAN [illegible] BE SEEN STAND[illegible] [illegible] THE WORK [illegible]

As To Power Development

The Trent Canal as a producer of electrical power is doing much towards the industrial development of this section of the province of Ontario. Roughly speaking, the various dams along the line of the Trent Canal from Lake Simcoe to Trenton are capable of developing 100,000 electrical h.p. Of course all the dams are not at the present time developed for the reason that the district is not as yet able to absorb all the power that is in sight. However the demand is rapidly increasing and new dams along the canal are each year being developed and the towns and villages for many miles adjacent thereto are being supplied with light and power at as low rates as the Niagara district, which is supposed to have the cheapest light and power in the province.

Every available water power along the route of the Canal, with one or two exceptions, has been acquired either by municipalities or by private companies. The ownership of these powers was acquired many years ago and in constructing the canal riparian rights were a matter that gave the Government considerable difficulty. However all matters of this kind are now adjusted and while the Government does not receive a revenue from all the water powers on the Canal, certain dams, however, which were taken over by the Government and improved, are revenue producers in so far as the Government is concerned. The leases provide for the use by the power companies of the surplus water after the interests of navigation have been served. It is estimated that the rentals for surplus water at various dams will, when fully developed, yield a revenue to the Government of Sixty or Seventy Thousand Dollars per year.

The following tables give the location of the dams, with their respective lifts and hydraulic power, on the line of the Trent Canal.

FROM LAKE ONTARIO TO RICE LAKE

	H.P.
DAM No. 1.—1.7 miles from Trenton Junction. 18 ft. head. At extreme low water of Lake Ontario a head of 20.0 ft. can be obtained. With a 18.0 ft. head, the amount of h.p. developed is	3,107
DAM No. 2.—2.9 miles from Trenton. 20 ft. head	4,040
DAM No. 3.—At Glen Miller, 4.8 miles from Trenton. A 27 ft. head can be developed here only with the consent, and in cooperation with Messrs. Miller Bros. Limited who are now using a head of 9 ft. In the event of Messrs. Miller Bros. Ltd. not consenting a head of only 18 ft. can be obtained. A 18 ft. head would produce	4,100
DAM No. 4.—5.5 miles from Trenton, having a head of 18 ft.	4,000
DAM No. 5.—8.6 miles from Trenton, having a head of 18 ft.	4,000
DAM No. 6.—At Frankford, 8.5 miles from Trenton. 5 ft. head. The surplus water at this dam is owned by The Trent River Paper Company. There is developed here	2,000
DAM No. 7.—At Glen Ross, 14.2 miles from Trenton. By a large expenditure of money a head of 9 ft. at this dam could be obtained. During high water the present head of 6 ft. at this dam may be somewhat reduced. A 5 ft. head would produce	1,136
DAM No. 8.—At the foot of Myers Island, 20.4 miles from Trenton. A 30 ft. head can be developed at this dam by the excavation of about 25,000 cubic yards of rock for a tailrace, and a 36 ft. head can be obtained at a still greater cost for tailrace excavation in rock. There is a 30 ft. head available without any tailrace excavation. A 30 ft. head would give	6,437
DAM No. 9.—At the head of Myers Island. There is a 16 ft. head available without any expense for tailrace excavation. With considerable expense excavation a 24 ft. head can be obtained which would develop	5,454
DAM No. 10.—At Ranney's Falls, just below Campbellford, and 30.6 miles above the town of Trenton. A 45 ft. head is in course of development in the vicinity of Lock No. 10	10,000
DAM No. 11.—Known as Stephen's Rapids, just above the Town of Campbellford. The power at this point is developed by the Seymour Power Company. There is a head at this point of 30 ft. Amount of power developed	6,437

DAM No. 18.—At foot of Crow Bay. This power is developed by the Municipality of the Town of Campbellford. The head is [illegible] ft. Power developed is	[illegible]
DAM No. 18.—At Healey's Falls, 14 miles below the Village of Hastings. A head of 76 ft. can be obtained at this dam by the expenditure of considerable money in tailrace excavation. This is considered the most valuable water power on the entire Trent system, and is under lease to the Seymour Power Company (The Electric Power Company Limited). It is not yet developed but with a 66 ft. head will produce	[illegible]
DAM No. 14.—At Hastings, owned and developed by the Fowlds Company. There is a head of 6 ft. which is slightly reduced during the high water season. A 9 ft. head will give	1,584
Total amount of h. p. available between Lake Ontario and Rice Lake	[illegible]

The flow of the Trent River from below Healey's Falls to Trenton is estimated at 120,000 cubic feet per minute. At Healey's Falls and Hastings the flow of the river is estimated at 90,000 cubic feet per minute.

FROM RICE LAKE TO STONY LAKE

DAM AT LOCKS, just below the City of Peterborough. This dam is not developed. It has a head of 6 ft. at low water, but during the high water season this almost disappears, hence the power is of little value. However, if a head of 8 ft. could be maintained and taking the flow of the river at 80,000 cubic feet per minute, the amount of power available would be	1,000
DAM AT LONDON STREET, Peterborough, owned and developed by the Peterborough Hydraulic Power Company (The Quaker Oats Company)	2,000
DAM AT AUBURN, owned and developed by The Peterborough Light and Power Company (The Electric Power Company Limited)	1,000
DAM KNOWN AS WATERWORKS DAM, just above City of Peterborough, owned and developed by the City of Peterborough	1,500
NASSAU DAM, owned and developed by The Canadian General Electric Company	1,000
DAM No. 6, Peterborough-Lakefield Section. Leased to and developed by the [illegible] Power Company. This dam along with No. 4, a short distance above, can be jointly developed to provide	4,000
DAM No. 3.—Leased to and developed by the Canada Cement Company	1,400
DAM No. 2.—Not yet developed, owned by the Dominion Government	[illegible]
DAM No. 1.—Owned and developed by The Dickson Company of Peterborough	[illegible]
DAM AT YOUNG'S POINT—Owned and controlled by the Canada Cement Company	[illegible]
Total h. p. on this section	[illegible]

In the estimate of the amount of available power on this section, the figures furnished by the Ontario Hydro-Electric Commission are used, with the exception of the estimate on the dam just below the City of Peterborough and the Young's Point Dam. The Hydro-Electric Commission's estimate on the dams from Peterborough to Lakefield is considered to be very conservative, the flow of the river being reckoned at 54,000 cubic feet per minute. It is pretty generally conceded that the low water flow of the river from Clear Lake to Rice Lake is [illegible] cubic feet per minute.

FROM STONY LAKE TO CAMERON LAKE

BURLEIGH FALLS DAM.—Owned by The Electric Company (The Central Ontario Power Company). There is a head here of [illegible] ft. Taking the flow of the river at [illegible] cubic feet per minute the amount of power that may be developed will be	[illegible]
BUCKHORN DAM.—Owned by the Electric Power Company. Not yet developed. A head of 10 ft. Taking the flow of the river at 20,000 cubic feet per minute, the amount of power available here would be	1,700
BOBCAYGEON DAM. Taking the flow of the river at 20,000 cubic feet per minute, with a 12 ft. head, the amount of power available is	[illegible]
FENELON FALLS DAM. The surplus water at this dam is owned and developed by the Light Heat and Power Company of Lindsay. The head here is 24 ft. and the flow of the river is estimated at 45,000, giving electrical h. p. to the extent of	[illegible]
The total amount of h. p. on this section therefore is	[illegible]
	[illegible]

Few people realize that the 100,000 electrical h. p. capable of being developed along the Trent Canal from Balsam Lake to Trenton, is equal to 1,000,000 tons of coal for which we are paying the United States four million dollars annually.

The 100,000 electrical h. p. above referred to does not include the power developed on the Severn River, which flows from Lake Simcoe to Georgian Bay.

VIEW OF RIVERVIEW PARK, TAKEN FROM STREET RAILWAY WHARF, PETERBOROUGH

VIEW OF THE PETERBOROUGH SIDE OF THE OTONABEE, TAKEN FROM RIVERVIEW PARK, SHOWING PETERBOROUGH WHARF AND STREET RAILWAY LINE

ANOTHER VIEW OF RIVERVIEW PARK, TAKEN FROM NEAR TERMINUS OF THE STREET RAILWAY

As a Tourist Resort

THE route of the Trent Canal consists of a chain of lakes and rivers unsurpassed on the Continent in their varied attractiveness as tourist resorts. It is only in recent years that these picturesque waters have been commercialized in the matter of being advertised as tourist resorts, but to-day there is not one available point or island on the lakes and rivers throughout the entire system that is not dotted with pretty summer homes and comfortable hotels maintained almost exclusively for the tourist traffic. The growth in the popularity of these waters as an ideal spot to spend the summer months, has been really astonishing, and to-day they are receiving a degree of advertising by railway companies, equal to that given the much older established, but no more attractive, resorts such as the Thousand Islands and Muskoka.

A certain section of the Trent Canal is commonly known as the Kawartha Lakes. "Kawartha" is the Indian word for "Bright Waters and Happy Lands." They comprise fourteen beautiful lakes—Scugog, Sturgeon, Cameron, Balsam, Pigeon, Bald, Sandy, Buckhorn, Chemong, Deer, Lovesick, Stony, Clear and Katchewanooka—to which may also be added Rice Lake, twenty-one miles down the Otonabee River below Peterborough.

The altitude of these famous lakes lends them additional charm for the tourist and pleasure seeker, some of them being 830 feet above sea level, or 600 feet higher than Lake Ontario, and 200 feet higher than Georgian Bay. On these charming waters the pleasure seeker will find delightfully cool wooded shores and sandy beaches, where bathing may be indulged in with safety.

The accommodation for travellers at the various points on these waters is much superior to the average summer resort. For those who wish to take their family for an outing, the cottage or camp on the shores of these waters affords a vacation at a very moderate expense. The hundreds of miles of shore and the many islands of the Kawartha Lakes specially lend themselves to the enjoyment of a summer outing. The Kawartha Lakes lying on the line of the Trent Canal, are linked together by narrow locks and channels, which enable the boat of the pleasure seeker to pass from one to another until the whole chain is explored. The eye never has time to weary of one scene before the rounding of a point, the passage of a lock or the widening of the narrows puts before you a new prospect. The dip of an oar, the stroke of a paddle, the whir of a motor, or the turn of a [illegible] wheel is enough to bring a fresh section of the Kawartha panorama into view.

These Highland Lakes of Ontario are like, and yet unlike, the Scotch lochs. They do not possess the awful grandeur of those of Switzerland, nor the cold ruggedness of some of the Scotch lochs, yet there is about them an inspiration more subdued and peaceful, while every point and island, every bay and headland, glows with a sweetly picturesque beauty. Slowly threading a narrow passage between verdure-clad mounts, the rounding of a point will suddenly bring into view a broad expanse of water whose continuous shores seem to have no outlet, but hidden behind some island or projecting headland will be found a passage leading through another labyrinth of beautiful scenery, and just as further progress seems impossible, another entrance suddenly breaks on the view.

Lovely as were the Kawartha Lakes when Nature displayed them to advantage before the enthusiastic gaze of Samuel de Champlain and his Indian allies, yet now, with all that Nature then did, improved by the artistic hand of man, they are simply enchanting. Travellers in Scotland, or readers of Sir Walter Scott's or other descriptive works of "The Bonnie Highlands," are not unfamiliar with the wild grandeur of the Scotch lochs, and all this magic scene is reproduced within the compass of the Kawartha Lakes. The more the scenery is studied, the more convinced one becomes that the charms which are spread out under a Canadian sky can vie with the most lovely which are scattered under distant climes. The student of geology, the botanist, and the amateur photographer find a field well worth while in the Kawartha country.

As far as the canoeist is concerned, this midland district of Ontario is one broad, continuous network of lakes extending to James Bay, and the voyages to be taken by the enthusiastic lover of the canoe have but one limit—the time at the disposal of the voyager.

The Hydraulic Lift Locks

IN attempting to describe the hydraulic lift locks on the Trent Canal we can not do better than to reproduce a few extracts from a paper prepared by Mr. Walter J. Francis, C.E. (Tor. Univ.), M.Can.Soc.C.E. Mr. Francis at the time of the construction of these locks, was in the service of the Department of Railways and Canals and had immediate charge of the work. In January, 1907, Mr. Francis read a paper at the annual meeting of the Canadian Society of Civil Engineers at Toronto, his subject being "Mechanical Locks in Canada." While space will not permit of our using the article in its entirety, it is hoped that the extracts taken therefrom and published below will give the reader some slight idea, at least, of the hydraulic lift locks on the Trent Canal. Mr. Francis said in part:

Built for the Canadian Government by Canadian contractors, under the direction of Canadian engineers, the hydraulic locks on the Trent Canal may properly bear the label "Made in Canada." In view of the fact that the German Government has recently completed a high canal lift at Henrichenburg, and that the United States Government has made a careful study of the problem of mechanical lifts in connection with the reconstruction of the Erie Canal, a detailed description of the Canadian hydraulic locks may be considered appropriate at the present time.

The larger of the two Canadian locks is situated on the Trent Canal within the limits of the corporation of the city of Peterboro, and has been in operation since June, 1904. The other lock, near the village of Kirkfield, is in a stretch of canal joining Balsam Lake and Lake Simcoe.

The hydraulic lock is theoretically an automatic machine and is designed to take the place of ordinary locks where a great difference of level is found in a short distance. Besides the Peterborough and Kirkfield locks, there are three other locks of this type in operation, one being in England, another in Belgium and the third in France. The English lock has been in continuous use for over thirty years, while those in France and Belgium have been completed about twelve years. They all have a lift of nearly fifty feet. The depth of water at the French and Belgian locks is 7 feet [illegible] inches, and the lock chambers are 140 feet long and nineteen feet wide. Several others having similar dimensions are now being built by the Belgian Government. The chief dimensions of the Peterborough Lock are 65 feet lift, chambers 140 feet long, with 33 feet clear width, and 8 feet normal depth of water. The Kirkfield lock has the same general dimensions with a lift of 50 feet. It will be noticed that in the Peterborough lock the water load is double that of the larger European ones, while the height of the lift is increased over thirty per cent.

In principle the hydraulic lock may be likened to two immense hydraulic elevators of the simple plunger type, having their presses connected together so that the descent of the one causes the rise of the other. In place of the ordinary elevator platform we have a large water-tight box or tank closed at either end by a gate. The lockage is performed by towing the vessel into this box of water and then closing the gate on the end of the box, as well as that at the end of the canal, thus leaving the box independent of the reach and free to move vertically. The box with the water and the floating vessel is then raised or lowered to the other reach. The chamber or lock about to descend is loaded with a few inches more water than the other chamber, thus giving it the necessary additional load or surcharge to enable it to cause the ascent of the other when water communication is established between the two presses. The construction of the Canadian locks varies materially from those of Europe, and as far as outward appearance goes, there is little similarity. The departures are largely due to the climatic conditions and to the different practices adopted by American and European engineers in steel construction.

For purposes of detailed description the Peterborough lock will be taken first, and the differences in the Kirkfield structure will be noted later in the paper.

[illegible]

THE PETERBOROUGH HYDRAULIC [illegible] LOCK LOOKING FROM THE WEST

A gradual slope was selected for the site of the Peterborough lock, and the excavation was completed in 1899. The position was chosen so that the average depth of excavation was about 40 feet, and the material thus obtained was used in building embankments to carry the level of the upper reach to the back of the structure. The excavated material was found to be hard clay mixed with small stones and boulders, underlying a thin layer of fertile soil. At the upper end of the excavation a small amount of hardpan was encountered, and below this a shaly limestone rock. The rock was in layers of from ½ inch to 6 inches in thickness, between which were thinner layers of clay and shaly material. The layers of crystallized limestone stand the weather quite well, but the shaly parts disintegrate very rapidly under the action of rain and frost. The elevation at which rock was found was exceedingly fortunate, being practically at the bottom of the pits. When the rock was cleaned off less than two feet of concrete brought the floor to its proper grade. No footings were required under any of the walls, all being built upon the solid rock.

After dealing in detail with the excavation of the pits, in which the large presses stand, Mr. Francis' paper gives a description of the substructure of the lock. It is built entirely of concrete and contains a little over 26,000 cubic yards. The breast wall is forty feet thick and 80 feet high, the length being 136 feet at the base. The towers, three in number, are on the same transverse centre line as the walls. In round numbers, the total height of each tower from rock bottom to top is 100 feet.

The earth embankment upon which the canal is carried up to the back of the breast wall was built in layers about 6 inches in thickness, thoroughly compacted and rolled. During the hot and dry season the earth filling was liberally watered. The material was clay containing small stones. This method produced an embankment having the remarkable record for settlement of only about 1/10 feet in a period of nearly a year where the depth of made earth was upwards of forty feet.

The contract for the embankment and substructure was executed by Messrs. Corry & Laverdure of Ottawa, and completed in 1902.

Dealing with the superstructure Mr. Francis says:—

The superstructure of the Peterborough lock was built by the Dominion Bridge Company of Montreal. The work was commenced in the summer of 1901, and the structure was completed early in July, 1904. The cost of the superstructure complete was $244,000.00.

Each of the lock chambers is 139 feet x 33 feet, with 9 feet 10 inches of plating on the sides. These dimensions, with the exception of the depth of water, were fixed by a Government Commission. It was also necessary that a clear headway of 25 feet be left above the water level. The depth of water for which the lock is constructed would, in ordinary navigation language, be called 8 feet on the sills. The load of water which each of the lock chambers contains is 1,300 tons, and this is the maximum load which it is necessary to provide for, since a floating vessel displaces only her own weight of water.

The structural steel work is minutely described by Mr. Francis, as well as the gates and their mechanism, and the main presses and rams. After manufacture and before erection all the castings of the presses were subjected to a rigid hydraulic test at a gauge of 1,200 lbs. per square inch, being twice the working pressure.

As to the materials and general appearance, *Mr. Francis says*—

A summary of the amounts and various kinds of metal used in the superstructure is as follows:—Rolled steel in plates and shapes for the lock chambers and gates, 1,840,000 lbs.; cast iron in rams, accumulator, guides, and various machines, 495,000 lbs.; steel castings for the main presses and accumulator, 605,000 lbs.

Care has been taken throughout to make the general appearance of the work as attractive as possible. All the walls and stairways are protected by suitably designed railings, and the windows and doorways are closed by ornamental grille work. The lockmaster's cabin on

The top of the centre tower is constructed of concrete as high as the window sills. Above this the steel frame work is furred with wood and the whole of the exterior covered with copper. The interior is finished in British Columbia cedar in the natural color.

Many people who visit the hydraulic lift locks and see them in operation are at first puzzled to know how the space between the lock chamber and the frame of the reach gate is made water-tight. Mr. Francis explains this thus:

There is a space of nearly 2 inches between the end of the lock chamber and the frame of the reach gate. When it is desired to connect the lock chamber with a reach, this machined space has to be closed. This is done by having a collapsible rubber tube fastened to the frame of the reach gate and arranged so as to fit this. When the lock chamber is in position for communication the rubber tube is inflated with air at about [illegible] pounds per square inch pressure, which causes it to expand and press against the end of the chamber.

The operation of the lock is described by Mr. Francis as follows:—

The operation of the hydraulic lock requires three men—a lockmaster and two assistants or gatemen. The lockmaster is in charge and is responsible for the structure. Two gatemen are required, one at the lower end and the other at the upper, to open and close the gates, to inflate or deflate the seal tubes, and to operate the capstans. The gatemen also take charge of vessels in about 200 feet on either side of the lock. The lockmaster during operations stays in his cabin on the top of the centre tower and has full view of all that transpires. He is also in communication with his two assistants by a simple signal system. The lockmaster has before him the principal levers, and through an interlocking system regulates the working of the lock. The levers for controlling the gate engines and the capstans are situated on the wall immediately above the respective machines, convenient of access to the gatemen. The interlocking system is so arranged that the lockmaster must set his levers in proper order, and these having been set neither he nor the gatemen can err by using their levers at the wrong time.

In order to get a clear idea of the complete mode of operation, let us assume that both lock chambers are down at the lower level, empty, as they are at the end of winter, or when it is desired to prepare them for navigation purposes. The annular space in each of the presses if empty will be filled with water. The main valve in the connecting pipe will be closed and water will be pumped into one of the presses until the ram, with its superimposed chamber, rises to the level of the upper reach. An examination of the case will show that it is necessary that the uppermost chamber, in order that it shall be able in descending to cause the other to take the full upward stroke, must contain a volume of water greater than the rising chamber contains. This extra amount is equal to the volume of one of the rams, since the change that takes place during the relative motion of the two chambers is that the ram of the descending chamber becomes constantly immersed, while the other protrudes. In other words, the descending chamber is losing weight while the ascending is constantly becoming heavier. It is also necessary that some extra weight be provided so as to overcome the friction of the guides, and of the stuffing boxes of the main presses. The area of each lock chamber is so great that it requires only an additional depth of 8¼ inches to give an extra load of water of 100 tons, which is sufficient for ordinary operation. The addition to this weight will, of course, have the effect of accelerating the rate of the relative change in position of the chambers. The ordinary time required in raising the chamber through the whole elevation is about two minutes. But this will depend upon the adjustment of the main glands, the nicety of the working of the guides, and the manipulation of the main valve in the hands of the lockmaster.

An ordinary lockage is conducted in this manner. Suppose 100 tons of surcharge has been found to give sufficient additional weight to the descending chamber. The uppermost chamber will then be required to stop with its floor 8¼ inches lower than the bottom of the upper reach. On communication being established with the reach, it receives from the reach 100 tons more than the lower chamber contains, assuming the depth in both reaches to be the same. Then the total operations to make the lockage, if the gates adjoining the reaches are opened and the seal tubes are inflated, consists in hauling the vessel into the chamber and mooring her there securely, closing the gates, deflating the seal tubes and opening the main valve between the presses. The heavier chamber then commences its descent, the motion being allowed to increase gradually by the gradual opening of the valve until it reaches the maximum speed. At about three-quarters of the stroke the main valve is slowly closed, communication between the presses being entirely cut off when the end of the journey is reached. The change in elevation being made, the seal tubes are inflated, the gates are opened, and the vessel or vessels are free to go on their journey, after being towed out by the capstans. The surcharge contained in the descending chamber simply flows out into the lower reach, while a similar quantity to perform the next lockage is admitted into the chamber which has just reached the higher elevation.

The record lockage so far at the Peterborough lock is 6¼ minutes, being the whole time from the stopping of the vessel in the lower reach to her proceeding on her journey under her own steam in the upper one.

The Reservoir Waters

THE Trent Canal district may be said to have furnished to Ontario the first real practical demonstration of the value of water conservation. While the Trent Canal has been heard of for many years and has, in its day, constituted a sort of political football with which perhaps both of the great political parties have played, it is, at the same time, as a means, a waterway for the transportation of the products of the country that it has been advocated and to which it has invariably been referred. This waterway which when completed will run through the midland counties of Ontario connecting Georgian Bay with Lake Ontario at Trenton, constituting a route for barges of 8 feet 6 inches draught fully 25 miles shorter to Montreal than by the Welland Canal, is in reality nearing completion. It will therefore be a matter of a short time only until the advocates of this route will have an opportunity of demonstrating to the world, if they can, that the Trent Canal, projected nearly 75 years ago, can carry grain from Midland to Montreal at cheaper rates and in faster time than by the Welland route.

However, it is not along this line that I am now going to discuss the Trent Canal, but rather as a means by which electrical power has been developed along its route and the factor it is playing in the industrial development of its district. Next to the Niagara there is no district, in older Ontario at least, in which the water falls are being developed to a greater degree than along the line of the Trent Canal. There has been a number of crude timber dams on this waterway for many years back at which power has been to a limited extent developed. It has been during recent years only, however, that the great possibilities of power development on the Trent Canal have been fully realized. Efficient and modern power houses are now looming up at the various dams and the district thereabout is becoming a network of power transmission lines.

This is due to two main reasons. Firstly, it might be stated that the final adoption of the route the Canal should take at certain points, and the erection of substantial new concrete dams by the Dominion Government for Canal purposes, made many valuable sites available for the development of power. These dams are, at the present time, practically all acquired. Most of them are already being used in the development of electrical energy and the remainder of them are about to be utilized. They are owned by various private persons, joint stock companies and municipalities. The nature of the titles, and power privileges in connection with these dams vary considerably. Some of them are owned outright by private individuals and they are entitled to all the surplus water without any yearly rental. The dams thus held were secured many years ago, either before a canal was seriously thought of, or before the value of water powers was understood. Other dams are merely leased from the Government (the terms of the leases varying) upon payment of a certain annual rental, being based, of course, upon the amount of power developed. Such dams as these are now placed under the control of the Railway Commission in so far as the matter of rates to consumers of power is concerned. This was a very wise move on the part of the present Minister of Railways and Canals, and ensures to the public the delivery of power at a reasonable price.

But the remarkable development of electrical power on the Trent Canal is not due to this alone. The flow of the Otonabee and Trent Rivers, on which the great portion of the power is developed, has, by a judicious and aggressive policy of conservation, been increased to such an extent that it has contributed perhaps to a greater degree than the construction of new dams to the present highly satisfactory state of affairs, and has materially contributed to the development of the towns and villages along the route of the Canal. When it is realized that the flow of the Otonabee River at Peterborough has increased over 100 per cent during the past five years, one can realize that water conservation on the Trent Canal has been a reality.

Until five years ago, the waters of the Trent Canal and the waters of what is known as the Trent Canal watershed were under separate management. That is, the main lakes and rivers that constitute the Trent Canal proper were under the control and management of the Dominion Government, while the "feeders" thereto were under the control of the Government of the Province of Ontario.

It must be borne in mind that the County of Haliburton and those portions of the counties of Peterborough and Victoria north of the main line of the Canal, contain almost countless lakes of various depths and sizes. A glance at a map drawn on a reasonably large scale, on which these lakes are shown, would undoubtedly surprise one who is not personally familiar with the locality. Some of these lakes are quite large, Redstone, for instance, in the township of Guilford, having an area of 3,061 acres; Kennisis, in the township of Havelock, having an area of 3,833 acres, and Gull Lake, in the township of Lutterworth, having an area of 2,748 acres. These lakes empty into various streams that finally discharge into the Trent Canal. The two of the largest of these are known as the Gull River, which flows into Balsam Lake at Coboconk, and the Burnt River, which flows into Cameron Lake, just above Fenelon Falls.

However, there are other streams that are valuable as "feeders" to the Trent Canal, a full list of which, together with the areas (in acres) of their basins, is as follows:

	ACRES		ACRES
Gull River basin	60,564	Deer Bay Creek basin	2,547
Burnt River basin	22,950	Buckhorn Creek basin	855
Nogies Creek basin	4,671	Squaw River basin	343
Mississauga basin	7,092	Jack's Creek basin	4,198
Eels Creek basin	2,683		
		Total	93,2[illegible]

This does not include the Crow Bay waters, which empty into the Trent River below Healey's Falls. Crow Bay waters are still under the control of the Ontario Government.

During the year 1906 an agitation was started by the power users along the Trent Canal, as well as by the navigation interests, to have the control of above-mentioned watershed, or what is now commonly known as the reservoirs, transferred from the Province of Ontario to the Dominion Government, in order that there might no longer be a dual system of management in connection with the water that finally passes through the Otonabee and Trent rivers on the main line of the Canal. Until that time the normal flow of the Otonabee River at Peterborough was 44,000 cubic feet per minute. There was no uniform flow of water, for the reason that it was practically impossible, under the conditions then existing, to control it.

At certain periods of the year—during the spring and early summer—an unnecessary amount of water came surging down the Otonabee and Trent Rivers, while by the month of August there was not enough water to drive the wheels of the various power houses on the Canal, or supply the requirements of the navigation interests. This state of affairs was due to the fact that those in charge of the tributary waters had no interest whatever in these streams other than to assist the lumbermen in getting out their logs. The Ontario Government had built timber dams at the outlets of many of these lakes, which were controlled by the Provincial Department of Public Works. The dams were built and operated in the interests and for the sole benefit of the lumbermen. When the lumbermen brought their logs out of the various lakes, there would be an abnormal and unnecessary flow of water come down into the main Canal. The stop logs would remain out until the following spring, when the same process would be gone through.

It was argued, and quite properly so, that if the entire area of the Trent Canal watershed, together with the water in the main line of the Canal, were placed under one management, a system of conservation could be inaugurated whereby, without any interference with the rights of the lumbermen, a steady and increased flow could be made to pass down the

Otonabee and Trent Rivers at all seasons of the year. It was of course contended that the control should be vested in the Dominion Government in view of the requirements for navigation purposes. After some months of negotiation, in which prominent men of the district, regardless of political creed, took part, the transfer to the Dominion Government was made in July, 1905, the Provincial Government handing over all lakes, rivers, and streams tributary to the Trent Canal north of Peterborough. The Dominion Government agreed to protect the rights of the lumbermen in respect of the use of dams on these streams, and guaranteed to them all privileges they had hitherto enjoyed.

The Department of Railways and Canals, under whose control this splendid watershed now came, at once got busy. Money was voted for the repair, rebuilding and improving of the dams at the outlets of these various lakes. The old timber dams were in many instances replaced by substantial concrete structures. Others were repaired and tightened, and in nearly every other case the dams were raised by many feet over their former level. On the various streams good, competent, and experienced men were placed to operate the stop-logs at the different dams, and an almost perfect system was built up. The result of the work is thus far most surprising. The water is now conserved in the springtime; the lumbermen's drives are taken out with care, and by using only what water may be absolutely required. The stop-logs are immediately replaced after each drive passes out, and the water is bottled up until such time as it may be required in the late summer or fall months on the main Canal.

The beneficial results are clearly indicated. The flow of the River Otonabee was increased to 90,000 cubic feet per minute, being just twice that it was five short years ago. Power development at each dam has correspondingly increased, and more power is accordingly available for distribution throughout the district.

It must be borne in mind that the system is not yet extended to the full limit of its possibilities. Each year more new reservoir dams are being built, and for some years to come there will be scope for still further improvement. An extreme dry spell may, to some slight extent, tax the present greatly increased capacity of the various power plants, yet there is not a power company operating on the Trent Canal, especially from Peterborough down, that will not say that the flow of water in the Trent Canal has been steadier, more uniform, and 100 per cent. greater throughout the entire year than it was five and six years ago.

There is no doubt, therefore, that water conservation in this district has been successful to a most surprising degree. There is no doubt also that the successful working out of this policy has resulted in great industrial growth which is as yet in its infancy, for the reason that many of the best dams of the Trent Canal are only now being harnessed with a view to supplying the very attractive market which awaits it.

It is only fair to say that the success of this scheme is in a very large measure due to the superintendent of the Canal, Mr. J. H. McClellan, who has given the matter a thorough study, and has maintained throughout that degree of enthusiasm with which he some years ago entered upon the work.

[illegible] RESERVE [illegible]

188,465 Acres of Water

It may surprise many to know that the area of the various lakes that form the portion of the Trent Canal from Balsam Lake to Trenton is 89,079 acres. To this may be added the area of what is commonly termed the Reservoir Waters and which is 99 350 acres. This, therefore, would mean that exclusive of the many fairly large rivers and streams there are 188 438 acres of water flowing continuously down through the Trent. This area is made up as follows

RESERVOIR WATERS

	ACRES		ACRES
Gull River basin	40 884	Jack's Creek basin	4 188
Burnt River basin	22 [illegible]	Crow River basin	16 148
Nogies Creek basin	1 871	Deer Bay Creek basin	2,847
Mississauga basin	7 002	Buckhorn Creek basin	655
Eels Creek basin	2 683		
Squaw River basin	341		99,350

	ACRES		ACRES
Balsam	10,300	River Buckhorn to Burleigh and Deer Bay	4 140
Cameron	3,100	Stony and Clear	18 874
Scugog	16 000	Rice	17 000
Sturgeon	9,250		
Pigeon	9,064		89 079
Chemong	5,400		
Buckhorn	4 000	Total	188 438

Of course, Lakes Simcoe and Couchiching, which are on the west of the Trent Canal, have an area of 283 square miles. Their waters, however, flow through the Severn River into Georgian Bay, and after flowing over Niagara Falls join their neighboring waters of Balsam Lake in the Bay of Quinte.

The Crow River basin of 16 148 acres flows into the Trent Canal just below Healey's Falls. The Superintending Engineer of the Canal in his annual report to the Department, estimates the low water flow of the Trent River below the point at which the Crow River basin enters at 2,000 cubic feet per second, while at Healey's Falls the low water estimate is 1 800 cubic feet per second.

The Charts Explained

In making a trip over the Trent Canal, yachtsmen and others who may desire to refer to the charts herein, will observe that these charts have been arranged in the following order:

1 Chart of Lakes Couchiching and Simcoe
(From the entrance to the Canal near Beaverton to Balsam Lake, no chart is required, the channel following the Talbot River for some distance, and the remainder of the distance being through an artificial reach.)

2 Chart of Balsam Lake and Cameron Lake

3 Chart of Sturgeon Lake

4 Chart of Pigeon Lake.

5 Chart of Buckhorn Lake and Chemong Lake

6 Chart of Deer Bay and Lovesick Lake from Buckhorn to Burleigh

7 Chart of Stony Lake and Clear Lake
(The channel from Young's Point to Peterborough through Lake Katchewanooka and the River Otonabee is easily located without the aid of a chart.)

8 Chart of Otonabee River and Rice Lake

Height of Locks

The following table gives the location of the locks, with their respective lifts, on the Ontario-Rice Lake Section, now under construction.

NO. OF LOCK	MILES FROM TRENTON	LOCALITY OF LOCK	LIFT OF LOCK
1	1 6	Trenton Junction	20 ft
2	2 4		20 ft
3	3 9	Glen Miller	27 ft.
4	5 2		16 ft
[illegible]	[illegible] 4		19 ft
[illegible]	7 3	Frankford	[illegible] ft.
7	13 [illegible]	Glen Ross	[illegible] ft
8	25 2	Percy Landing	20 ft
9	26 4		18 ft.
[illegible]0	27 8		24 ft.
[illegible]	29 8	Ranney Falls	6[illegible] ft
[illegible]	29 [illegible]	Ranney Falls	2[illegible] ft
[illegible]3	33 1	Campbellford	23 ft
[illegible]4	53 8	[illegible] Falls	25 ft
[illegible]5	36 1	Crow Bay	26 ft
[illegible]	38 [illegible]	Healey Falls	27 ft
17	38 5	Healey Falls	27 ft
18	51 [illegible]	Hastings	[illegible] ft

It will be seen by the above table that the total lift from Lake Ontario to the reach above the Hastings lock is 368 feet. The new lock at Hastings, replacing the old lock built about the year 1637, was thrown open to traffic this spring, and there is once again through navigation to Healey's Falls.

The following table gives the location of the locks, with their respective lifts, on the navigable portion of the Canal from the Otonabee River, below Peterborough, to Balsam Lake, the summit waters of the Trent Canal.

	LENGTH BETWEEN GATES	WIDTH	DEPTH ON SILL	LIFT
Lock at Peterboro	34 ft	33 ft	[illegible] ft	4 ft
1 Lock at No. 6 Peterboro Lakefield Division	42 ft	33 ft	[illegible] ft	16 ft
1 Lock at Peterboro hydraulic lift lock No. 1	4[illegible] ft	33 ft	8 ft.	65 ft
1 Lock at No. 5 Peterboro Lakefield Division	142 ft	33 ft	6 ft	4 ft
1 Lock at No. 4 Peterboro Lakefield Division	142 ft	33 ft	4 ft.	[illegible] ft
1 Lock at No. 3 Peterboro Lakefield Division	43 ft	33 ft	6 ft	12 ft
1 Lock at No. 2 Peterboro Lakefield Division	42 ft	33 ft	6 ft	4 ft
1 Lock at No. [illegible] Peterboro Lakefield Division	142 ft	33 ft	4 [illegible]	18 ft
1 Lock at Young's Point	134 ft	33 ft	6 ft.	6 ft
6 Locks at Burleigh, each 11½ ft. (Upper)	134 ft	33 ft	6 ft	
(Lower)	150 ft	33 ft	[illegible] ft	24 ft
1 Lock at Lovesick	134 ft	33 ft	8 ft	[illegible] ft.
1 Lock at Buckhorn	1[illegible] ft	33 ft	[illegible] ft	[illegible] ft
1 Lock at Bobcaygeon	134 ft	33 ft	[illegible] ft	7 ft.
2 Locks at Fenelon Falls each 12 ft. (Upper)	134 ft	33 ft	[illegible] ft.	
(Lower)	15[illegible] ft	33 ft.	[illegible] ft	24 ft.
[illegible] Lock at Rosedale	17[illegible] ft	33 ft	[illegible] ft 4 [illegible]	4 ft

It will be observed that the lift from below the City of Peterborough on the Otonabee River to Balsam Lake is 227 feet.

The following table gives the location of the locks with their respective lifts, after leaving Balsam Lake and descending to Lake Simcoe

	L'GTH B'TW'N HOL. QUOINS	WIDTH	DEPTH ON SILL	LIFT
Lock at Kirkfield hydraulic lift lock No. 2	140 ft	33 ft	8 ft	50 ft
Lock No. 1 Simcoe-Balsam Lake Division	142 ft	33 ft	8 ft	21 ft
Lock No. 2 Simcoe-Balsam Lake Division	143 ft	33 ft	8 ft	14 ft
Lock No. 3 Simcoe-Balsam Lake Division	142 ft	33 ft	8 ft	14 ft
Lock No. 4 Simcoe-Balsam Lake Division	142 ft	33 ft	8 ft	14 ft
Lock No. 5 Simcoe-Balsam Lake Division	142 ft.	33 ft	8 ft	11 ft

It will be observed that Lake Simcoe is 124 feet lower than Balsam Lake

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The Cost of Construction

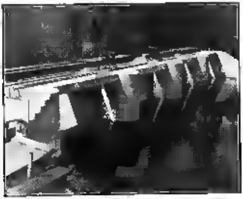
The following table shows the amount spent each year and the total amount spent to the 31st March 1910, on the Trent Canal chargeable to Capital Account

Government expenditure prior to Confederation	$ 500 371 31	1895	53,007 70
1880	641 60	1896	392 876 08
1881	——	1897	485 576 70
1882	——	1898	351 273 51
1883	40 707 16	1899	[illegible] 40
1884	120 213 41	1900	334 553 0
1885	121,382 84	1901	284,503 64
1886	75 195 36	1902	449 075 45
1887	170 541 63	1903	823,950 74
1888	114,878 35	1904	480 036 44
1889	47 592 13	1905	333 26 75
1890	60,044 50	1906	210,765 49
1891	9,826 49	1907	153 045 42
1892	4 457 28	1908	343 179 05
1893	8 083 47	1909	1 049 836 36
1894	3 4 2 32	1910	1 900 000 00
		Total	$7 875 501 99

Some Distances

The following table of distances on the Trent Canal may be found both useful and interesting

ON MAIN LINE OF CANAL	MILES
Port Severn to Washago, via Severn Bridge	31.0
Washago to Narrows	16.0
Narrows to Gamebridge	16.0
Gamebridge to Balsam Lake	16.0
Balsam Lake to Rosedale River	5.0
Rosedale Bridge to Fenelon	4.6
Fenelon to Bobcaygeon	14.5
Bobcaygeon to Buckhorn	16.5
Buckhorn to Burleigh	7.0
Burleigh to Young's Point	6.0
Young's Point to Lakefield	8.0
Lakefield to Peterborough	10.0
Peterborough to Rice Lake	21.0
Rice Lake to Birdsall's	12.0
Birdsall's to Hastings	6.0
Hastings to Trent Bridge	8.0
Trent Bridge to Healey's Falls	6.2
Healey's Falls to Campbellford	6.10
Campbellford to Chisholm's	17.0
Chisholm's to Frankford	6.6
Frankford to Trenton	7.8
ON CHEMONG LAKE	
Chemong Park to Buckhorn	13.5
Chemong to Bobcaygeon	16.70
ON CLEAR AND STONY LAKES	
Young's Point to	
End of Clear Lake	4.6
Juniper Island Store	6.0
Boschink	6.0
Crow's Landing	12.0
Head of Lake	16.0
Juniper Island to Burleigh	3.35
Crow's Landing to Burleigh	6.0
ON OTONABEE RIVER	
C.P.R. Bridge to G.T.R. Bridge (Peterboro)	1.20
Wolfe St. Wharf to lower end of Peterboro Lock	1.40
Wolfe St. Wharf to Rye's Boat House	1.75
Lower End Peterboro Lock to Crawford's Grove	1.37
Wolfe St. Wharf to Crawford's Grove	2.77
Wolfe St. Wharf to Hale's Bridge	6.50
Peterboro Lock to Hale's Bridge	5.40
Hale's Bridge to Bensfort Bridge	3.00
Wolfe St. Wharf to Wedlock's	15.70
Wolfe St. Wharf to Jubilee Point	21.20
Wolfe St. Wharf to New Cut	21.00
Bensfort Bridge to Wedlock's	6.00
Wedlock's to Jubilee	2.50



HORSESHOE [illegible] DAM ON [illegible]
THIS IS ONE OF THE RESERVOIR DAMS ON THE TRENT CANAL WATERSHED

[illegible] ON [illegible] LAKE-LAKE SIMCOE SECTION

FACULTY OF ARCHITECTURE
LANDSCAPE AND DESIGN
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UNIVERSITY OF TORONTO
230 COLLEGE STREET
TORONTO, ONTARIO M5T 1R2

ORILLIA

In view of the commercial importance of the construction of the Trent Valley Canal it is natural that the attention of those interested in this great project should be riveted on the Town of Orillia which is rapidly becoming the great Industrial Centre of Northern Ontario. Orillia, which is located on the western shore of Lake Couchiching, and which also overlooks Lake Simcoe, has quickly developed into a town of importance. The location and the push, enterprise and energy of the townspeople have been [illegible] themselves to make it what it is. Orillia is a progressive, picturesque and healthful town of [illegible] thousand five hundred people. Not the least of her great advantages is her easy accessibility and her excellent railway and transportation facilities. Three great Railways now run through the Town, The Grand Trunk, The Canadian Pacific and The Canadian Northern, which will mean rapid development for her industries, as transportation rates will be the cheapest and the best. As an example of the enterprise of her citizens, Orillia was the first Municipality in Ontario to develop a Water Power and install an Electric Power Transmission Plant, which was done in 1900 on the Severn River, and all her industries are now run by electricity. A low and special rate is offered to all industries and many of these have been brought here through this attractive power rate. From this Plant twenty-two hundred horse-power is being used at the present time for Municipal and Manufacturing purposes, and one thousand horse power is now being added. There are one thousand men employed in the various factories. The Tudhope Motor Company employ three hundred men; The Tudhope Carriage Company two hundred. The Canada Refining and Smelting Company installed their new plant in the town in the fall of 1910 and are now enlarging their plant so as to double its capacity. The Canadian Wood Specialty, The Long Manufacturing Company, The [illegible] Planing Factory, together with various other Manufacturing Concerns are all running to their full capacity and contemplate extending their plants. These and other industries have caused growth for the town and during the last year the population increased by more than seven hundred. Building of various kinds is going on in every direction and it has been carefully estimated that over one-quarter of a million dollars worth of building and improvements will be done within the town limits during this season. The optimist expects Orillia to outgrow her town status during the next five years and to have become the Industrial City of Northern Ontario.

From a Summer Resort standpoint the town is well known and her principal charms arise from her situation on the two beautiful lakes, Couchiching and Simcoe. Lake Couchiching is about thirteen miles in length and five miles in width and contains many beautiful islands. The whole region is full of scenic beauty and is a delight to all lovers of nature. One of the principal attractions of the town from a Summer Resort standpoint is the splendid thirty acre lakeside park known as Couchiching Beach Park, which also forms the recreation ground for the townspeople and tourists. Boating is one of the favorite pastimes in Orillia and fair canoeists, sturdy oarsmen, sailing craft and motor boats are everywhere in evidence. Tennis has many devotees and tennis courts are found on many of the citizens' lawns. For those fond of golf there are excellent golf links and these are patronized daily by a large following. Orillia is a town of well-shaded streets, of exceptionally fine homes, of beautifully kept lawns and of fine churches, schools and civic buildings. On the shores of the lake are situated the summer homes of people from Canadian and American cities. Some come from as far south as New Orleans.

Orillia, with the two-fold advantage of being an Industrial and railway centre, as well as summer resort, must become one of the most important towns along the route of the Trent Canal. Lakes Simcoe and Couchiching form a link in this great waterway system and both empty into the Severn River, which will be the outlet of the Canal to the Georgian Bay. Surely such a grand location on the junction of the Trent Canal and the three Transcontinental Railways must give promise of a greater future for the already progressive, attractive and flourishing Town of Orillia.

The Town of Barrie

IS situated at the head of Kempenfeldt Bay, Lake Simcoe, in shape resembling a horseshoe. It is the County Town of Simcoe, Province of Ontario, and has the County Municipal Buildings, and Law Courts. BARRIE is on the main line of the Northern Division of the Grand Trunk Railway, 62 miles north of Toronto, and is the divisional point of five branches of the G. T. R. BARRIE has a service of 16 trains arriving and leaving daily and a continuous heavy freight traffic. BARRIE owns and operates its own Electric Light Plant. The price of light per 1000 Watts is 8 cents. An all day service for power purposes at low rates will be quoted to applicants.

BARRIE'S population is 6,950.

BARRIE owns and operates its own Waterworks System, which is managed by a Commission. The supply from Artesian wells is inexhaustible and is absolutely pure, in fact the purest on the Continent, being 6 per cent. above par by analysis. The capacity per day of six hours is 2,400,000 gallons; fire pressure, 80 lbs.; domestic pressure 60 lbs. The price for single tap flat rate is $6.00 per annum. The price for 1000 gals. by metre is 22 cents domestic.

BARRIE has 25 miles of cement sidewalks and splendid roads.

BARRIE has 5 Banks, 10 Hotels, Local and Long Distance Telephones, 4 Printing and Newspaper Offices, 12 Churches, Armouries, Theatre, Public Library, Y. M. C. A., Gas Plant and a 52-roomed Hospital.

BARRIE has an excellent sewerage system and is a very healthy town to live in. Hay fever is entirely unknown.

BARRIE is beautifully situated and has natural scenery in abundance, is the mecca for tourists, and often termed "The Venice of America." Kempenfeldt Bay affords good boating, fishing and bathing.

BARRIE is the home of the Barrie Tannery, Barrie Carriage Works, Canadian Producer and Gas Engine Co., Barrie Planing Mill, The Ball Planing Mill Co., and other industries.

BARRIE has many advantages for manufacturers of Woodenware, Knitting Mills, Tanneries, Shoe Factories, Wool Factories, etc., and has a number of excellent factory sites at a very low figure.

BARRIE has plenty of labour, both skilled and unskilled.

BARRIE is surrounded by a magnificent farming country and has a good market for live stock, produce, grain, etc.

BARRIE'S boat service connecting with Orillia and other towns and resorts on Lake Simcoe, is good and improving yearly, and is greatly appreciated by summer tourists. It has within a few miles inland the shore front suitable for summer cottages and summer residences.

BARRIE Citizens' Band is a first-class organization and gives free concerts weekly throughout the summer months.

ORGANIZATIONS AND SOCIETIES.—Barrie Bowling and Tennis Club, Barrie Horticultural and Town Improvement Society, Barrie Aquatic Club.

BARRIE SPORTS.—Swimming, Boating, Fishing, Bowling, Tennis, Golf, Ball, Lacrosse, Driving, Motoring, etc.

Fenelon Falls, Ontario

To the thousands of campers, tourists, owners of power yachts, from both Canada and the United States who annually spend their summer vacation on the beautiful chain of lakes between Balsam and Cameron Lakes, constituting the Trent Canal, no summer resort is more favorably known than Fenelon Falls, Ont. This charmingly situated little town is practically in the heart of one of the most beautiful sections of the Kawartha Lakes. To the tourist who depends upon his canoe or paddle to convey himself and his summer outfit from point to point, no more admirably situated and picturesque location could be selected. The everlasting roar of falling water soothes the senses of the man who, in town or city, has his nerves upset by the strenuous competition of modern life. The Fenelon River, rapidly flowing past the hotels, in which he may stop, with its tree-crowned banks, where vegetation seems to defy nature by springing from cracks and crevices in the massive granite, teems with game fish. In the shadow of the granite banks lurk maskinonge and black bass, only waiting for the spoon of the troller or the bait of the still fisherman. Within a few hundred feet of the admirably conducted and well provided hotels of Fenelon Falls is one of the best fishing grounds, if water may be so described, to be found in our grand Dominion. Fenelon Falls can boast of having some of the finest and best managed hotels in Ontario.

The drinking water of Fenelon Falls is exceptionally pure and good. From Fenelon Falls the owners of gasoline and steam launches can readily ply to all parts of the Trent Canal system. The summer visitor there has magnificent boating, fishing and bathing within a few feet of his hotel. The public steamboat service is unsurpassed. Fenelon Falls is within easy reach of Lindsay, Peterboro and Toronto by rail.

Manufacturers seeking locations where cheap power and transportation are a material factor should keep Fenelon Falls in mind. Electric power is here to be had for $[illegible].00 per horse-power. The Town Council and Board of Trade of Fenelon Falls, both active and progressive municipal bodies, offer possible locating manufacturers, free building sites and exemption from taxation, should such locating factories employ a reasonable number of hands. Full information along such lines will be fully, freely and cheerfully supplied on application by the Secretary of the Board of Trade, Fenelon Falls, Ont. Fenelon Falls is *THE* place to spend your summer vacation if you want Health, Happiness, Good Bathing, Good Boating and Good Bass Fishing.

The Electric City—Peterborough

A MOST interesting point on the Trent Waterway is the City of Peterborough, with a population of 18,000. It is the only City on the Waterway and is one of the most prosperous, progressive and attractive places in the Dominion. The growth of the City, especially in the last few years, has been rapid, owing to the industrial development that has taken place, and in attractiveness and beauty it has kept pace with its expansion and increase of population. The basis of the growth of Peterborough is the fact that it has all the essentials and accessories for manufacturing and distributing, and in this respect it has advantages that are not excelled anywhere. The essentials for a manufacturing centre are:

Cheap electric power and plenty of it.
Shipping facilities for reaching all markets.
Suitable sites for industries.
And good labor conditions.

Of Electric power, developed from the water powers on the Otonabee River and other waters, Peterborough has an abundant supply. Several of these power sites have been developed and others are being developed, and as fast as it may be called for 30,000 horse power of hydro-electric power can be supplied. This abundant supply of power is furnished and delivered to the user for power purposes at very low rates—so low as to be most attractive to manufacturers.

The shipping facilities are unexcelled. The City is located between the two commercial centres, Montreal and Toronto, and is on the line from the Georgian Bay (which means the Northwest) to the seaboard, and is in a central location for reaching all the best markets. It has both the Canadian Pacific and Grand Trunk Railways. The Grand Trunk branches out in four different directions from the city, and besides being on the main line of the Canadian Pacific Railway between Montreal and Toronto, it is also on the Canadian Pacific line to the Georgian Bay. It has thus direct connection with all parts of the Dominion. The Trent Waterway also gives water communication, as is described in this publication.

The number and diversity of the industries in Peterborough make labor of all kinds easily obtainable, and labor troubles are unknown. The workmen are largely home-owners and interested in the welfare of the city. Owing to expenses being lower than in the larger centres, the cost of labour is lower, which is a great advantage to the manufacturer.

Possessing these essentials for manufacturing and distributing, Peterborough also has excellent systems of sewers and waterworks, electric street railway, several large and fine parks, handsome churches and public buildings, a number of well-equipped public schools, Collegiate Institute, and Provincial Normal School, first-class mercantile establishments, three hospitals, theatres, a low rate of taxes, most efficient fire protection—all the conditions for business, health, comfort and pleasure.

The summer resorts adjacent to Peterborough are celebrated ones, including Stony Lake, with its picturesque islands, Chemong Lake, with its beautiful park, and the Otonabee River and Rice Lake, with their numerous attractive resorts.

These advantages of situation given by nature, and the acquired advantages that have been secured and built up, combined with the public spirit of the citizens, have resulted in Peterborough passing all the other towns in the district in the race for advancement. Its manufacturing industries are numerous, including The Canadian General Electric Company's works, in which about 2000 employees are engaged, The Quaker Oats Mills, The Brinton Carpet Factory, whose parent industry is in England, and woollen mills, tack factory, tool factories, makers of mill, mining and hydraulic machinery, agricultural implements, locks and builders' hardware, harness and saddlery, stoves, boats of all kinds, bolts and wires, rope and cordage, gasoline engines, lumber, brick, furniture, cereal products, steam engines and pumps, show cases, mattresses, pork products, and many other lines. Altogether there is $12,150,000 of capital invested in manufacturing in Peterborough, and the annual production of the industries aggregates $42,000,000. Frequent enlargements are emphatic evidences of the prosperity of the industries. Wholesale houses, of which there are several, testify to the city's advantages as a distributing centre.

The many superior advantages of Peterborough are open to new industries, and enquiries will be willingly answered and information cheerfully given, and every effort will be made to facilitate their establishment. For any more intelligence on any point or for specific information bearing on any line of manufacture, write to the City Clerk, and prompt attention will be given.

Trenton

BESIDES being the southern outlet of the Trent Canal, Trenton is conspicuous for its many natural advantages. For many years the citizens of Trenton have looked forward to the development of the water power on the Trent River. In a small way the Trenton Electric and Water Company have for a number of years developed a limited quantity of power at the Town lumber dam, while the Gilmour Lumber Company also developed sufficient power at the same dam for their own use.

During the last couple of years the Electric Power Company has secured the practical control of all the powers on the River from Healey's Falls to Trenton, and it is estimated that their total development will exceed 100,000 horse power. This Company, with its network of transmission wires, has covered the Central Ontario district thoroughly and has acquired many of the local lighting and power plants in the towns and villages between Oshawa and Kingston.

Last January an excellent Council was elected, and as a result of their efforts and with the assistance of an energetic Board of Trade, Trenton has advanced faster commercially than ever before. The Council and Board of Trade of 1913 will long be remembered as having assisted most materially in bringing Trenton's advantages before the people of Canada and the United States.

Cheap power has, of course, been the magnet which has attracted many of the new industries to Trenton. Power at $15.00 per H. P. twenty-four hours service, delivered at the customer's terminals, is certainly a drawing card. The Town of Trenton has at this rate 1000 H. P. to dispose of, having, in return for a lease of its power rights at Dams 1 and 2 to the Electric Power Company, accepted this amount of power as part of the settlement. The Trenton Electric and Water Company has now available for Trenton users, 10,000 horse power, and upon the completion of Dam No. 3 will have to dispose of 20,000 H. P.

Of all the towns along the Canal, Trenton promises the greatest development, because it has the added advantage of being on the deep waters of Lake Ontario, and being served by more railways than any other town in Ontario. Trenton can offer great facilities for shipping by rail. It is the junction of the Grand Trunk and the Central Ontario Railways. This latter road is part of the Canadian Northern Ontario System, lately acquired, and Canadian Northern trains will be running through Trenton in July of this year. The Canadian Pacific lake shore line, now being surveyed between Toronto and Montreal, will run through Trenton. The proposed electric road between Toronto and Montreal will also traverse Trenton.

With easy access via the Murray Canal to Lake Ontario, Trenton has superior advantages as a distributing centre by water. The Richelieu & Ontario Navigation Company's Steamer "Belleville" calls here regularly twice each week when on her run between Toronto and Montreal, while the large and handsome steamer of the Ontario & Quebec Navigation Company "Alexandria," running between Rochester and Quebec, makes the same number of calls in Trenton. The "Gerona," the handsome new boat just launched at Collingwood, will also ply on this route. The steamers "Varuna" and "Brockville" make daily trips between Trenton and Picton, calling at Belleville and Deseronto. In addition to the passenger and package freight business catered to by these boats, many large freighters call at Trenton carrying chiefly coal cargoes.

In addition to being a manufacturing town of importance, Trenton is fast coming under the notice of the people of Canada as a tourist centre. Where can you find a more beautiful spot for the summer campers and cottagers than the shores which skirt the Trenton harbour? The land locked water stretch is always comparatively calm. The turbulent waves from the lake do not ruffle its surface. How many would avoid the fatiguing crush of an Atlantic watering place if this ideal existence were brought to their notice with one-tenth the persistency which the United States displays in keeping their places before the public. If the other transportation companies who are especially interested in this district would do as much to make its advantages known as the Ontario & Quebec Navigation Company has done, many more would come here every year.

It is fairly expected that in less than two years it will be possible for small boats to ascend the Canal as far as Washago on Lake Couchiching above Orillia. To anyone acquainted with the beautiful scenery along the banks of the River Trent, the prospect of taking this trip in a comfortable motor boat will be most enticing. Probably the finest black bass and pickerel fishing in Ontario is to be had in the waters of the Bay of Quinte and the River Trent.

Sports of every kind, having in view the physical development of the young men of the town, are freely indulged in and encouraged liberally. The boys and girls who grow up in Trenton will always look back to the days of their childhood with intense pleasure. No inland town for them.

Electric Motive Power for Eastern and Central Ontario

THE most pronounced feature connected with the opening up of the Trent Valley Canal, and closely allied with its engineering aspect, is apparent in the recent rapid development of the abundant water powers of the basin which the Canal traverses for three-fourths of its length. Rising in the remotest parts of the Highlands of Ontario the Trent waters are collected by half a dozen important tributaries and poured turbulently into the long chain of Kawartha Lakes, covering approximately an area of 70,000 acres, and whose mean elevation above Lake Ontario is 550 feet.

From this huge reservoir the water drops in a succession of falls varying from 10 to 75 ft in height and scattered uniformly along the river's course, to its outlet at Trenton.

From these water falls about 100,000 H.P. is being made available on water wheel shafts and 75,000 H.P. delivered to the industrial centres as electric energy.

The economical generation, control and distribution to points of demand of this very large quantity of power by the various original individual proprietary interests was manifestly impossible. As a consequence the exigencies of the situation evolved a single comprehensive system whose modern and standardized hydro-electric stations dot the map from Burleigh Falls to Trenton.

Connecting and radiating from the generating centres, a net work of carefully planned transmission lines covers the whole of Central Ontario from Peterborough at the north to Kingston on the east and Whitby on the west, over which the power is distributed.

This organization of power resources is known as THE ELECTRIC POWER COMPANY LIMITED, with head offices in Toronto. Its power distribution system is almost completed and not only is every manufacturing centre in the Trent district benefiting by the cheap and abundant power it has brought to its doors, but there are few villages and rural centres which as yet remain to obtain electric light and modern electrical conveniences. This organization is furthermore giving the application of electricity to agricultural pursuits its close study, with a view of still further enlarging the scope of its market and making Central Ontario the most modern and well developed community, both industrially and agriculturally, in Canada.

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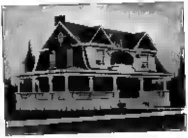

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The Gatlin treatment is convenient to take. It only requires THREE DAYS. The saving of from three to five weeks' time means something to a busy man. There are no hypodermic injections, no substitute stimulants, no poisonous drugs—just a simple, harmless, treatment which will in three days, free the system of accumulated alcoholic poison, thereby doing away with the CAUSE of physical and nerve-craving for liquor appetite and all inclination to drink it.

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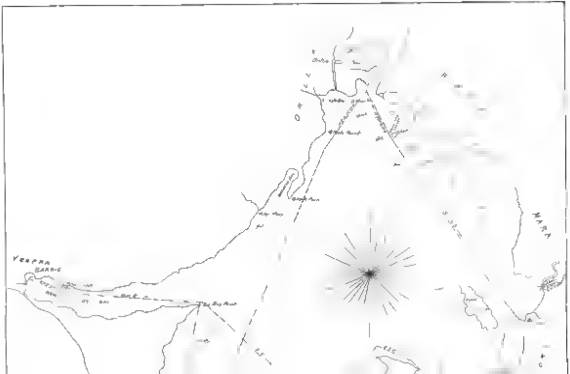

ORILL
MARA
VESPRA
BARRIE
OF BAY

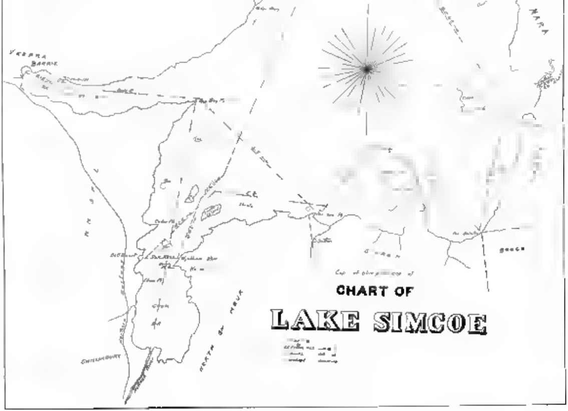
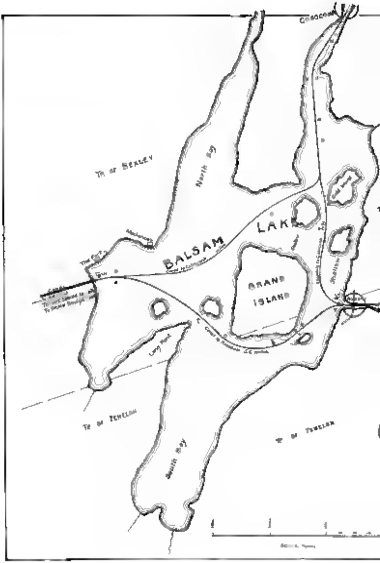
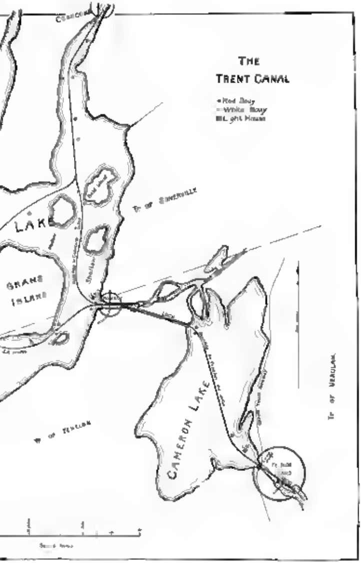
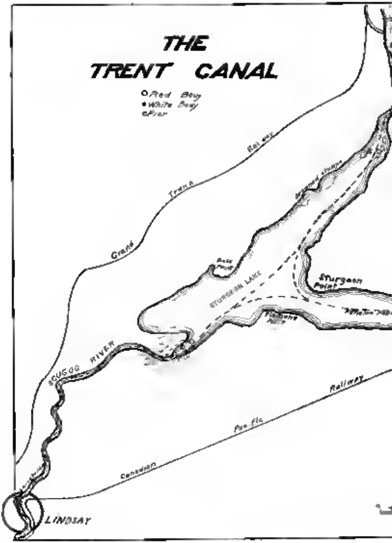
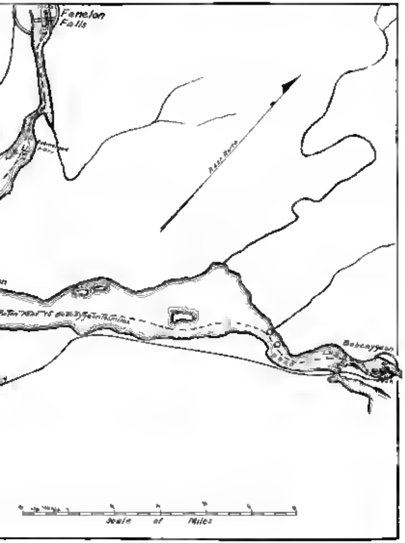

BARRIE
NARA

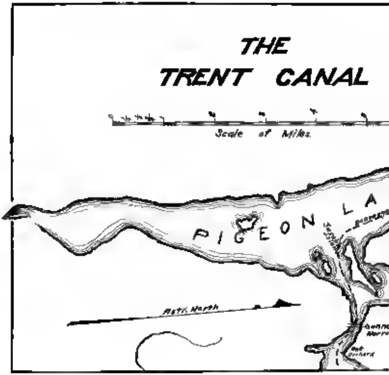
CHART OF
LAKE SIMCOE

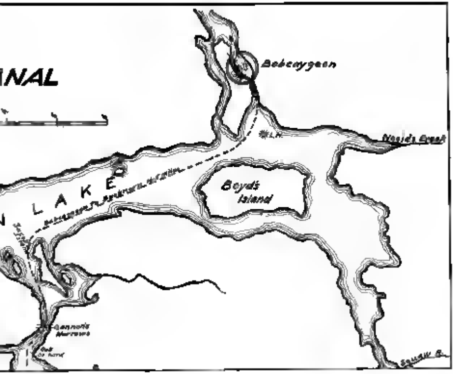

TP OF BEXLEY
North Bay
The Gut
BALSAM
LAKE
GRAND
ISLAND
Long Point
TP OF FENELON
South Bay
TP OF FENELON

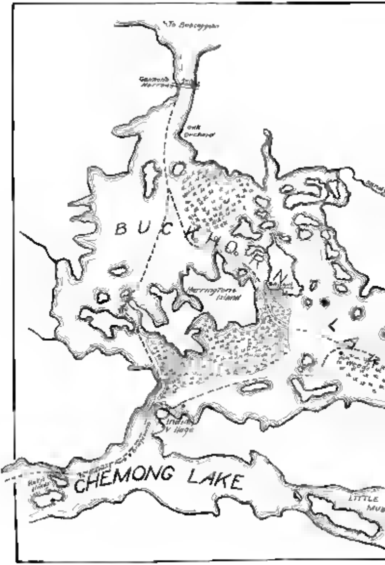

THE
TRENT CANAL
• Red Bouy
▫ White Bouy
■ Light House
COBOCONK
LAKE
GRAND
ISLAND
Shallow
Tp of SOMERVILLE
Lock
CAMERON LAKE
Tp of FENELON
Tp of VERULAM

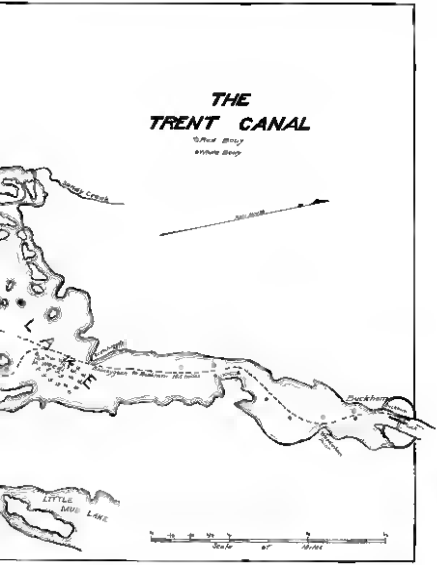

THE TRENT CANAL
○ Red Buoy
● White Buoy
Pier
Grand Trunk Railway
Drowned stumps
Ball Point
STURGEON LAKE
Sturgeon Point
Pleasant Point
SCUGOG RIVER
Canadian Pacific Railway
LINDSAY

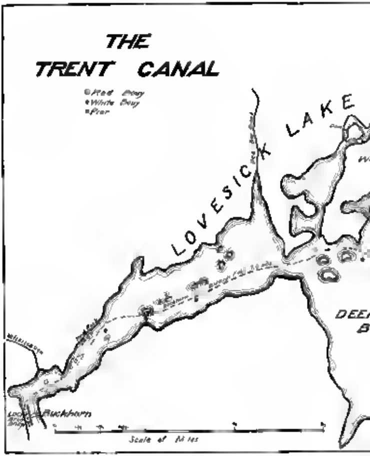

Fenelon Falls
Boat Route
Bobcaygeon
Scale of Miles

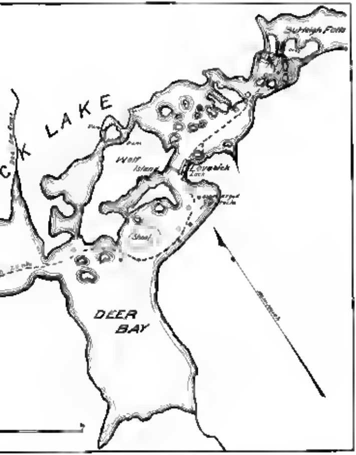

THE
TRENT CANAL
Scale of Miles.
PIGEON LA
Astr. North
Orchard

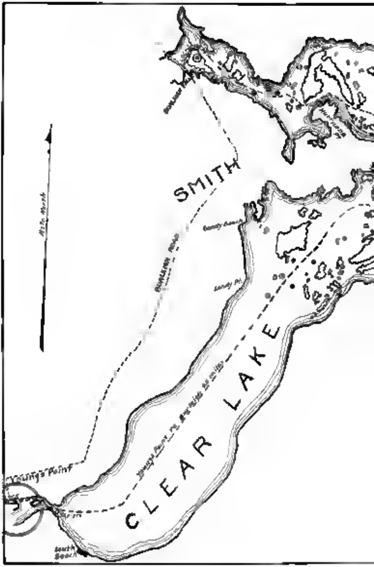

NAL
Bobcaygeon
L.H.
Nogie's Creek
L A K E
Boyd's
Island
Gannon's
Narrows
Squaw R.

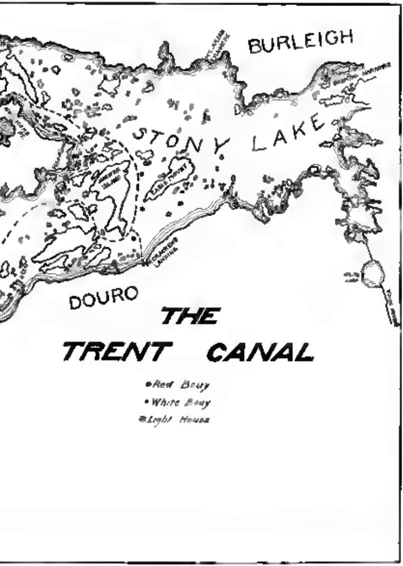

To Bobcaygeon
Gannon's Narrows
Oak Orchard
BUCKHORN
Harrington Island
Indian Village
CHEMONG LAKE
LITTLE
MU


THE
TRENT CANAL
Red Bouy
White Bouy
Sandy Creek
L A K E
Buckhorn
LITTLE MUD LAKE
Scale of Miles


THE
TRENT CANAL
Red Buoy
White Buoy
Pier
LOVESICK LAKE
DEE
B
Buckhorn
Lock
Scale of Miles

C K LAKE
Burleigh Falls
Wolf Island
Lovesick Lock
Shoal
DEER BAY

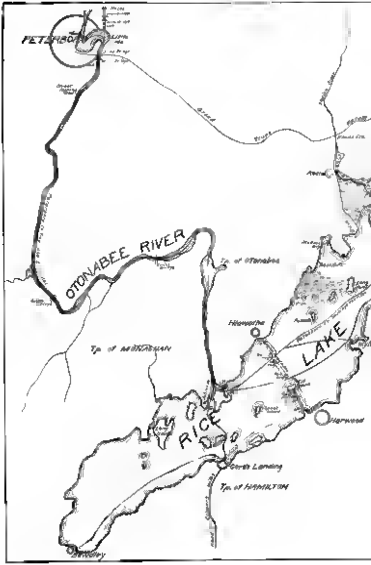

SMITH
Sandy Beach
Sandy Pt.
CLEAR LAKE
Young's Point
South Beach

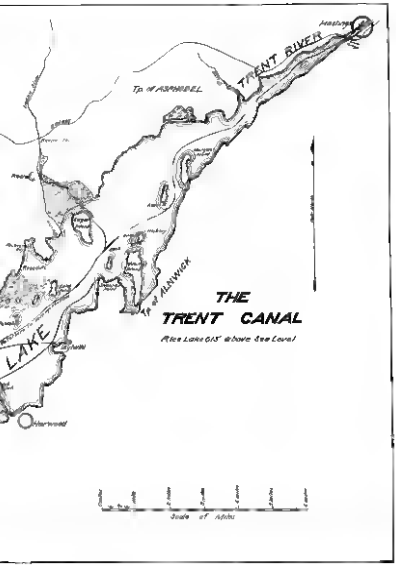


BURLEIGH
STONY LAKE
DOURO

THE TRENT CANAL

● Red Bouy
• White Bouy
⊛ Light House


PETERBOR
OTONABEE RIVER
Grand
Trunk
Tp. of Otonabee
Hiawatha
LAKE
Tp. of MONAGHAN
RICE
Harwood
Gores Landing
Tp. of HAMILTON
Bewdley


Hastings
TRENT RIVER
Tp. of ASPHODEL
Tp. of ALNWICK
LAKE
Harwood
THE
TRENT CANAL
Rice Lake 615' above Sea Level
Scale of Miles

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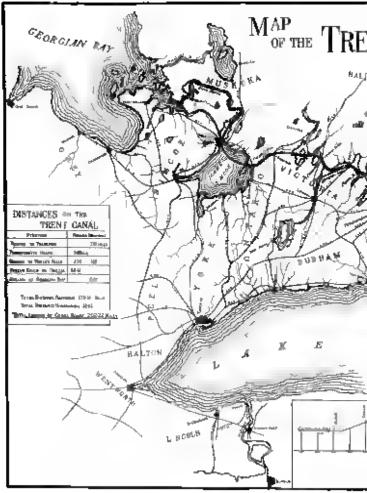
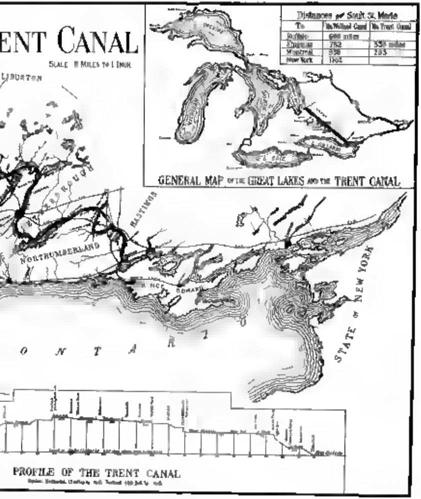

MAP OF THE TRE
GEORGIAN BAY
MUSKOKA
HALI
GREY
SIMCOE
VICTORIA
ONTARIO
YORK
PEEL
DURHAM
HALTON
WENTWORTH
LINCOLN
L A K E
DISTANCES ON THE TRENT CANAL


ENT CANAL
SCALE 8 MILES TO 1 INCH
LIBURTON
PETERBOROUGH
HASTINGS
NORTHUMBERLAND
PRINCE EDWARD
O N T A R I O
STATE OF NEW YORK
SUPERIOR
MICHIGAN
HURON
L. ONTARIO
L. ERIE
GENERAL MAP OF THE GREAT LAKES AND THE TRENT CANAL
PROFILE OF THE TRENT CANAL

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To	Via Welland Canal	Via Trent Canal
Buffalo	600 miles	
Kingston	782	538 miles
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SUPERINTENDENT	J H McCLELLAN A Can Soc C E PETERBOROUGH

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Lake Simcoe
Lake Couchiching
and
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THE GRAND TRUNK SYSTEM

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Passengers from eastern points, such as Quebec, Portland, and intermediate stations, proceed via main line Grand Trunk Railway System through *Montreal*, and those from Boston and all New England points by Boston & Maine, Central Vermont and other connecting lines through Montreal.

Tourists from the *Maritime Provinces* reach the Grand Trunk by the Intercolonial Railway via Montreal.

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KEENE	BEAVERTON
PETERBOROUGH	ORILLIA
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INTRODUCTION

DURING the past few years there have been a great many requests for detailed information regarding the Trent Canal. This has especially been the case since the completion of what is known as the Lake Simcoe-Balsam Lake Division, throwing open as it did an uninterrupted stretch of navigation of 160 miles, extending from Orillia on Lake Simcoe to Healey's Falls on the Trent River. The increasing popularity of the various lakes and rivers that constitute the Trent Canal as tourist and summer residence resorts has added greatly to the number of private yachts; steamboat business has increased to large proportions, and we now have practically a through steamboat service from the Trent River to points on Lake Simcoe. With this increase in the number of yachts and steamboats has come an increased demand for charts of the navigable channel and for information regarding the Canal generally. It is, therefore, with a view of satisfying the desire for enlarged knowledge in these respects that this book is compiled. I have endeavoured to present herein, in as complete and condensed a manner as circumstances will permit, charts of the various lakes which will prove useful to navigators, facts concerning the early history of the Canal, and more or less comprehensive details generally concerning the position the Canal occupies at the present time and is destined to occupy in the scheme of Canadian transportation.

I regret that at the time of the publication of this work no official charts were available in the Railways and Canals Department defining the navigation channels of the greater portion of the lakes and rivers that constitute the Trent Canal. The charts presented herein, while unofficial, are for the most part based upon the observation and experience of practical navigators, and will be found sufficiently reliable to permit of navigation with reasonable care and safety the 160 miles of Canal and connecting waters between Orillia and Healey's Falls. The chart of Lake Simcoe, however, which is herein published, is absolutely authentic, and should be found invaluable to vessel owners on Lake Simcoe.

E. S. CLARRY

MADE THE FIRST TRIP

THAT the route of the Trent Canal via the Severn and Trent Rivers was a recognized channel of water communication between Lake Huron and Lake Ontario by the Indian tribes of centuries ago is a well known fact. The Huron Indians who resided along the shores of Lake Huron and Lake Simcoe were undoubtedly familiar with this comparatively short water route to the Bay of Quinte. After paddling across Lake Simcoe and up the Talbot River for some little distance they portaged across to Balsam Lake, the summit waters between Georgian Bay and Lake Ontario. Hence we to-day have running across from Lake Simcoe to Balsam Lake what is known as the "Portage Road." It follows the same trail that was used by the Indian tribes of several hundred years ago.

Champlain, the French explorer, was the first white man to come down from Lake Huron to Lake Ontario by way of what was to be known nearly three hundred years later as the Trent Canal. This was in the year 1615. The story of Champlain's trip over these waters as told by Francis Parkman in his history "Pioneers of France in the New World" is most interesting. Champlain had gone up the Ottawa River and portaging over to Lake Nipissing came down the French River into Lake Huron. His expedition down through the Lakes and Rivers that now constitute the Trent Canal is best told in the historian's own words:

"At the outlet of Lake Simcoe they all stopped to fish,—their simple substitute for a commissariat. Hence, too, the intrepid Etienne Brulé, at his own request, was sent with twelve Indians to hasten forward the five hundred allied warriors,—a dangerous venture, since his course must lie through the borders of the Iroquois.

"He set out on the eighth of September, and on the morning of the tenth, Champlain, shivering in his blanket, awoke to see the meadows sparkling with an early frost, soon to vanish under the bright autumnal sun. The Huron fleet pursued its course along Lake Simcoe, across the portage to Balsam or Sturgeon Lake, and down the chain of lakes which form the sources of the river Trent. As the long line of canoes moved on its way, no human life was seen, no sign of friend or foe; yet at times, to the fancy of Champlain, the borders of the stream seemed decked with groves and shrubbery by the hands of man, and the walnut trees, laced with grape-vines, seemed decorations of a pleasure ground.

"They stopped and encamped for a deer-hunt. Five hundred Indians, in line, like the skirmishers of an army advancing to battle, drove the game to the end of a woody point; and the canoe-men killed them with spears and arrows as they took to the river. Champlain and his men keenly relished the sport, but paid a heavy price for their pleasure. A Frenchman, firing at a buck, brought down an Indian, and there was need of liberal gifts to console the sufferer and his friends.

"The canoes now issued from the mouth of the Trent. Like a flock of venturous wild fowl, they put boldly out upon Lake Ontario, crossed it in safety, and landed within the borders of New York, on or near the point of land west of Hungry Bay."

The First Survey

IT is just 78 years ago since the first survey was made of the proposed route of the Trent Canal. Twenty-four years later the project was discussed at considerable length in "Canadian Pamphlets," and a review of the efforts of the people of the Trent District to have the scheme carried to a successful issue is as interesting to-day as it no doubt was at that time. In reading the extracts herein taken from "Canadian Pamphlets" it will be observed that the Georgian Bay Ottawa River Canal scheme was a live issue at that time—just as it is to-day—but it looks certain that in the matter of construction the Trent Canal, although a great many years on the way, will carry vessels from Georgian Bay to Montreal before the larger scheme of the Ottawa River route is more than actually commenced. "Canadian Pamphlets," a publication of 1857, says: "In the year 1833 the project of connecting the waters of Lake Simcoe with those of Ontario by means of a Canal passing through Rice Lake and the Bay of Quinte was generally discussed, and received the attention of the Government. Mr. N. H. Baird, Civil Engineer, was appointed by His Excellency Sir John Colborne to make a survey of the waters connecting these two Lakes with a view of deciding upon the eligibility of the route for that purpose. He entered upon the work in 1833, and in that year completed the survey of the Trent and Otonabee Rivers. Having received further instructions, he resumed the survey in 1835, and continued it from Peterborough via the Otonabee and back waters to Lake Simcoe. This report of his surveys was exceedingly favourable. The estimates for the works made the entire proposed cost of opening up an uninterrupted water communication between the Bay of Quinte and Lake Simcoe, a distance of about 165 miles, and 706—4 feet of lockage, £495,515.

"Mr. Baird, however, appears to have feared that the amount of the estimate might deter the Government from prosecuting the work, to which he attached very considerable importance. He therefore made the suggestion that only the least expensive sections of the Canal should be at once proceeded with, and the other portions Railwayed, 'for which,' says the report, 'it is rather remarkable the whole ground of these intermediate sections afford the most favourable opportunity for construction that can be imagined or wished for, any descent that is, being in the proper direction, and easy of construction.' The estimate of the probable expense of forming a connection between Lake Simcoe and the Bay of Quinte on the double principle of railway and canal was £183,563.

"The objection of transhipment, an almost insuperable one in this double scheme, Mr. Baird proposed to get rid of thus: 'With the view of doing away with the only, at least the chief objection to the expedient system—the idea of frequent transhipment—I would propose that long and substantial steamers of particular construction should regularly ply to and from on the intermediate water communication, and so arranged as to admit of the train of cars being transported at once, with their loadings, direct either for Lake Huron or Lake Simcoe, as the case may be, and which I am satisfied can be done in such a way as to be practically useful, and serve well the present, and until such time as it may be deemed proper to put the lockage system in execution, the prospective wants of the country.'

"This project, great as was the interest which attached to it at the time, was never carried out. Some £90,000 odd was expended upon the River Trent work, and the lock at Peterborough basin, proposed by Mr. Baird, was constructed, but the troubles of 1837-38, and the changes which immediately succeeded, prevented the full execution of the project of connecting the waters of Lake Simcoe with the Bay of Quinte. The necessity for such a work, however, has never been lost sight of. Within the last two or three years the project of connecting the waters of Huron with those of Ontario or the St. Lawrence, with a view of directing the immense and growing trade of the Western States through Canadian channels—its natural outlet—has engaged the attention of the people and press, not only of Canada, but of

See

Chicago and the Western States. Two projects to that end are before the public: the one to connect the Georgian Bay with the City of Toronto, preliminary surveys of which have already been made, showing it to be a work of great, though by no means insuperable difficulties; and the other to connect Lake Huron with the Ottawa, a project to which Mr. Walter Shanley, one of our ablest Provincial Engineers, has given his adhesion. But it is quite evident that neither of these schemes, important as they unquestionably are, can for a single moment compare with that projected in 1833, to which reference has been made. The first, in addition to the immense expense of the work, $25,000,000.00, owing to the heavy cuttings that require to be made, and the great engineering difficulties that must be encountered, offers but problematical advantages as a national work. That it would prove of very great advantage to the City of Toronto, and divert much of the western trade through that city, is undoubted; but when that has been said, the main argument has been advanced that can be advanced in its favour. It opens up no new country, and the produce once in Ontario through Toronto stands equal chance of finding its way to the Atlantic through American as through Canadian channels. The second proposal, that of connecting the waters of Lake Huron with those of the Ottawa, stands deservedly high as a national enterprise. If constructed it would open up an immense section of country now absolutely useless, and it would have the effect of placing Canadian [illegible] before any other for the conveyance of the produce of the west to the markets of Europe, advantages which cannot be overlooked in the construction of this national work. But the heavy outlay required on such a work is likely to retard its completion for many years. The route *via* Peterborough and the Trent, while offering advantages almost equal to those of the Ottawa Canal as regards the opening up of the country and the development of trade by the St. Lawrence, is so much less expensive as to offer much greater prospect of immediate construction. The advantages of the Trent route were thus epitomised in a letter recently addressed by W. S. Conger, Esquire, to the Chief Commissioner of Public Works:

First.—It is shorter and more direct than any other—except the Toronto and Georgian Bay, which, from its great cost, may be set down as impracticable—from Chicago and the Sault Ste. Marie to the seaboard, whether *via* Montreal and Quebec or Portland or New York.

Secondly.—It passes through a rich and fertile country, and presents fewer engineering difficulties, and could therefore be constructed for a much smaller amount than either of the other proposed routes.

Thirdly.—Being at least two degrees further south than the Ottawa route, it would have the advantage of being open for two or three weeks longer every season.

Fourthly.—Its terminal harbours would be large and commodious—particularly that at the mouth of the Trent—having on one side the Bay of Quinte, and on the other, by a short and comparatively inexpensive cut, the Presque Isle Bay, the safest and most commodious harbour on Lake Ontario; thus affording an easy and safe entrance to Trenton from Lake Ontario and the River St. Lawrence.

The advantage of the Trent River in point of distance may be estimated by the following figures:

From Chicago to New York, *via* Buffalo and Erie Canal	1,615 miles
From Chicago to New York, *via* Welland Canal and Oswego	1,638
From Chicago to New York, *via* Huron, Nipissing, Ottawa & Caughnawaga Canal	1,353
From Chicago to New York, *via* Georgian Bay, Valley of the Trent and Oswego	1,232
From Chicago to Montreal, *via* Lake Nipissing	1,005
From Chicago to Montreal, *via* Georgian Bay and Valley of the Trent	1,003

It will thus be seen that in point of distance to New York, the Trent route has the advantage over the Nipissing and the Ottawa route by 126 miles. While between Chicago and Montreal the distance is in favour of the Ottawa route 28 miles, an advantage, however, more than overbalanced by the intricate and difficult navigation of the latter.

But the pages of a work like this can hardly be the place wherein to discuss this subject, and the reader is therefore requested to regard the remarks relative to the merits of the different Canal schemes now before the public as parenthetical in their character.

Such was the position of the various Lake Huron-Lake Ontario canal schemes, as viewed by "Canadian Pamphlets" in the year 1857.

Started By Imperial Government

As has already been stated, the locks just below the City of Peterborough and the locks at Hastings, on the Trent River, were built in the year 1837 or thereabouts. The construction of these two locks was the first step in a practical effort to connect Georgian Bay and Lake Ontario by means of this route, and they were built by the Imperial Government. As a matter of fact, a lock was also built at about the same time at Glen Ross, better known, perhaps, to many as Chisholm's Rapids, about 14 miles above the town of Trenton. Why Chisholm's Rapids was selected as one of the most important points to build one of the first locks on the system, few, we venture to say, can even imagine, as it did not afford any local benefit, nor did it throw open any substantial additional stretch of navigation. Its gates never opened to greet a friendly vessel, its grey limestone walls never re-echoed to the sound of the steamer's whistle, and for 70 years or more it stood as a monument to the enterprise of the Imperial Government. The lock at Chisholm's was demolished only a year or two ago, to make room for the substantial and modern concrete lock, which is already completed, and which is one of the 18 locks now being built on the Ontario-Rice Lake section of the Canal. The lock at Hastings, which afforded a means of navigation from Healey's Falls to Peterborough, a distance of 53 miles, remained in commission until one year ago, when it was closed and demolished, to be replaced by a more modern and much larger one. The lock at Peterborough has been deepened since its original construction, but its walls are about the same as they were when first built.

Other locks had been built at several points, but their construction was more with a view to meeting the requirements of local interests, rather than with a view to a scheme of through navigation. In fact, as far back as the year 1835, a lock was built by the Inland Water Commissioners at Bobcaygeon, which afforded a means of navigation from Sturgeon Lake to Pigeon, Buckhorn and Chemong Lakes. In the year 1837 the construction of a lock was commenced at Lindsay on the Scugog River, and it was placed in commission in the year 1843. It opened a stretch of navigation to Port Perry and other points on Lake Scugog. In 1860 a wooden lock was built at Rosedale, connecting Balsam and Cameron Lakes, and about the same date the building of the present lock at Young's Point was undertaken. When completed a few years later it afforded navigation for vessels between Lakefield and Burleigh Falls and other points on Stony Lake.

However, the idea of connecting Lake Huron and Lake Ontario by means of a canal through the Trent Valley was by no means dead. The interest taken in the project by Sir John Colborne, Lieutenant-Governor, and afterwards Governor-General, had induced many settlers from the Old Country to establish themselves on these waters, and the subject came up for discussion and renewed interest at intervals. About 1858 Mr. W. S. Conger, M.P. for Peterborough, called attention anew to it as a great route for transportation, and subsequently advocated its construction by appeals to the Government, and by speaking constantly of its merits in the House and in the press. Nothing was done at the moment, but in 1867, at the time of Confederation, the British North America Act reserved the works on these waters and their control for the Dominion of Canada, contemplating the completion of the project.

Soon after 1870 Mr. Mossom Boyd, of Bobcaygeon, took up the matter, accumulated much information, and by his energetic advocacy stimulated renewed discussion in the press. He obtained a charter for its construction as a private enterprise, and even proceeded to London to secure the interest of capitalists, but circumstances at that time were not propitious, and he was not successful in his efforts.

In 1878 the question was again brought up in a new light. The Ontario Government obtained from the Mackenzie Administration a transfer to them of the works on the Trent, and this was strongly opposed in the local press as giving up property expressly reserved at Confederation and virtually abandoning the idea of ever opening the Trent Waterway for transportation. The opposition leaders supported this view and when that element they succeeded to power they rescinded the order in council making the transfer. In the years 1878 to 1881 considerable survey work was done with a view to proceeding with the construction of the Canal. Mr. David Starke, C.E., and Mr. Tom S. Rubidge had been in that interval engaged in the work. Mr. Thos. D. Belcher became Superintending Engineer.

The agitation by the people of the Trent Valley district broke out pretty strongly about the year 1880 and by the year 1883 contracts were let by the Dominion Government for the construction of the locks at Fenelon Falls, Buckhorn, Lovesick, and Burleigh Falls. About 1887 these sections were thrown open for navigation, completing an inland stretch of navigation from Balsam Lake to Lakefield. About the same time the demand for the completion of the Canal became stronger and more emphatic than ever. Trent Canal Associations were organized, deputations representing the entire district from Midland to Trenton visited Ottawa, red hot newspaper editorials were handed out, and oratory with a vengeance and a Canal flavor was to be heard at public meetings.

Mr. Thomas Rubidge, one of the Government Engineers in charge of the work, was accused of being lukewarm on the project, and a glance at the report and estimate made by him on the proposed work would certainly go to show that he was not bubbling over with enthusiasm for the completion of the Canal. The Government of John A. Macdonald finally decided to appoint a commission to enquire into the merits of the proposition. This announcement was not very enthusiastically received by the friends of the project, who felt that the feasibility of the scheme, as well as its necessity, had been long ago established. However, the commission was appointed in 1887. It was composed of Messrs. Judge Weller, Peterborough; John Kennedy, C.E., Montreal; and Frank Turner, C.E., Toronto. They were to "consider the question of further extending the line of water communication between Lake Huron and Lake Ontario, and to determine whether it is advisable that an extension of the main work should be undertaken, and if so, to what extent," and under date of December 17th, 1890, these Commissioners, after personally going over the route, taking evidence at various points, including Kingston, Montreal, Albany and Buffalo, reported:

"In considering the bearing of the Canal upon the development of the trade and natural resources of the country through which it will pass, it should be noted that the conditions are peculiar, inasmuch as it would act as a connecting link in a chain of lakes and streams which for the most part lie transversely to the line of the Canal, and that it would therefore afford access to an extent of country and coast line much greater than usual in a Canal of its length.

"The Commissioners, upon the evidence and information which they have been able to obtain, and which accompany this report, are of opinion that an extension of the main work should be undertaken by the completion, as soon as convenient and practicable, of the work necessary to give continuous navigation from Balsam Lake to the Bay of Quinte. This would embrace the sections between Lakefield and Peterborough and between Healey's Falls and Trenton. In the opinion of the Commissioners a waterway would thereby be made which would not only increase the value of the works already constructed, but would assist and develop the industries along its route, and open up the resources of the country through which it would pass to such an extent as to amply compensate for the expenditure necessary to be incurred, although the work itself would not be expected to produce direct revenue.

"This conclusion is arrived at by a careful consideration of the evidence adduced before the Commission, by which the Commissioners feel they must be guided, such evidence in their minds greatly preponderating in favor of the extension of this important work in the manner indicated."

Although the Commission reported favorably to the completion of the Trent Canal in December, 1890, and although strong pressure was brought to bear upon the Government of the day to have new sections undertaken, it was not until 1896 that any move was made in the matter. Contracts were, in that year, let for the construction of the division extending from Lake Simcoe to Balsam Lake, and for the Peterborough Lakefield section. One of the contracts on the Peterborough Lakefield section included the construction of the Peterborough Lift Lock, while the Kirkfield hydraulic lift lock was included in one of the contracts of the Lake Simcoe-Balsam Lake Division. The Peterborough Hydraulic Lift Lock was opened in June 1904, and the Kirkfield Hydraulic Lift Lock in July 1907, thereby throwing open a stretch of navigation 160 miles in length, from Orillia to Healey's Falls.

The Peterborough Lakefield Division and the Balsam Lake Lake Simcoe Division, were built under the supervision of *Mr.* R. B. Rogers, M. Can. Soc. C. E., who from 1880 to 1907 was Superintending Engineer of the Trent Canal. When it was first suggested that hydraulic lift locks should be built on the Trent Canal, *Mr.* Rogers was instructed by the Department to proceed to Europe with a view of studying the matter of lift locks and their uses and report to this Department the result of his investigations. Mr. Rogers made the trip, gave the subject thorough investigation, acquired a large fund of information, having inspected three European locks in operation, and reported favorably on the feasibility of hydraulic lift locks on the Trent Canal. Mr. Rogers was in charge for the Government of the construction of both hydraulic lift locks.

In the year 1907 the Government decided to finish the southern outlet of the Canal. Accordingly in August of that year, the first contract on the Ontario-Rice Lake Division was let. The work on this Division is dealt with elsewhere.

Ten

VIEW OF LOCKS, YOUNG'S POINT

ENTRANCE TO LOCK NO. 6 X PETERBOROUGH. THE CA [illegible]

River

A Toronto View in 1887

It has been mentioned elsewhere that the Trent Canal scheme has at times received very little support from a certain section of the Canadian press. The friends of the Trent Canal declare this to be especially true regarding the press of the City of Toronto. It must, however, be noted in all fairness to the press of the province generally, that a more friendly interest has been displayed in the project during the past few years. That at least one Toronto daily paper had little faith in the scheme as a means of through navigation, as late as the year 1887, may be seen from the following editorial from the Toronto Mail of October 11th of that year:

The announcement that a commission has been appointed by the Dominion Government to enquire into the advisability of proceeding with the construction of the Trent Valley Canal suggests the fact that that great public undertaking has enjoyed, on paper, an extended and somewhat chequered career. The Canal was proposed in the year 1827. It is, therefore, after sixty-one years of discussion regarding it—for it has been talked about at every election—that the authorities have concluded that they are not quite sure the public requirements demand it. Delay, however, may not be fatal to the enterprise. Canal projects die hard, as witness the struggles of the Huron and Ontario Canal. Moreover, they have a habit of reviving just when it is supposed their last hour has come. The Murray Canal, for example, was proposed in the year 1797. Interest in it waxed and waned until 1880 or thereabouts, when, though everybody supposed the enterprise had collapsed, a contract was suddenly let for its construction. It was proceeded with much to the political advantage of the Government of the day, and is now an accomplished fact.

The original Trent Valley Canal proposition was not so extensive a scheme as that of to-day. The idea of its projector was merely to furnish a route by water from Lake Ontario to Lake Simcoe. The region in the neighborhood of Lake Simcoe was the Northwest of that period, and people were anxious to open it up for settlement and for trade. It was not until 1833 that the Canal was reported on by an Engineer, and it was then declared that two million dollars would complete it. It was at once resolved to proceed, but the work did not commence until 1837. For two years operations proceeded vigorously. In 1839, however, there was a stringency in the money market, during which the cash borrowed for the Canal was devoted to other projects, and as a result the contractors abandoned the work. In 1841 an attempt was made to revive interest in the scheme and to enlarge it so that it might provide a through system of navigation from Lake Ontario to the Georgian Bay. But the Board of Works reported that as a through line the Canal would not be successful, owing to the great lockage required and the limited draft of water of vessels which could be used on the route, and that for purposes of local traffic it would not be a success, because the route, through its greater part, was extremely tortuous. The estimated cost of the Canal was placed at $3,000,000.00, and it was suggested that instead of sinking so large an outlay the works already undertaken should be completed and used as timber slides. This plan was adopted, and the cost of the work up to the year of Confederation was $670,078.00. From Confederation on it has been impossible to convince successive Governments that a through Trent Canal is practicable. The first Conservative Government took little stock in the project, and the Mackenzie Government, after an effort to take over and complete the works, had failed, passed the whole affair, locks, dams and slides, over to the Ontario Government, the transfer having been accomplished just two days before the Reform Government went out. It was claimed that the object was to destroy the dams, rescue several thousands of acres of land which had been submerged for years, and in fulfillment of a campaign promise, distribute them through the Ontario authorities among certain favourites in the various constituencies along the route. This accusation was stoutly denied, and it was stated very plausibly that the works were passed over in Ontario because they were merely timber slides, and because the Government had resolved not to complete them with a view to the establishment of a through system of navigation.

In 1879 the Dominion re-assumed the works, and it has them still. The authorities have from time to time expressed opinions and adopted measures which have led the residents of the Trent Valley district to believe that the Government seriously intends to build the Canal. In the 1882 election this belief helped the Conservatives in Central Ontario counties, but in 1887 it was less potent, not because the Conservatives had altered their plans, but because the Reform candidates professed to be as anxious as any person could be that, despite the expense, the Canal should be built. In future contests the politicians in the district through which the projected work will run will no doubt vie with each other in their pledges of devotion to the interests of the Canal. The result will be that the work will be forced upon the party leaders, although it is almost a certainty that none of them approve of it.

JUBILEE POINT AT THE MOUTH OF THE OTONABEE RIVER

AT THE MOUTH OF EEL'S CREEK, STONEY LAKE

The Present State of Canal

AT the date of the publication of this work the extent of the finished portion of the Trent Canal is 160 miles, the distance from Washago nine miles above Orillia to Healey's Falls, now available for navigation by vessels of 6½ feet draft. There is, however, in addition to this a considerable extent of inland navigation for the draft mentioned by which side trips might be taken such as to the picturesque town of Barrie on Kempenfeldt Bay on the western side of Lake Simcoe; to Jackson's Point on the south shore of Lake Simcoe; or to Lindsay on the Scugog River, continuing farther down the stream to Port Perry on Scugog Lake.

After more than seventy years of a chequered career it now looks as if the Trent Canal as a means of through transportation from Georgian Bay to Lake Ontario will be an accomplished fact within the next four or five years. At the present time the entire division from Healey's Falls to Trenton is under contract and the work is being advanced with vigour by the various contractors. The fact that the Dominion Government has this year set aside the sum of $1,750,000 for construction work on this division shows that the energetic policy decided upon with respect to the early completion of the Canal will be carried out with the least possible delay. As a matter of fact it is regarded as extremely probable that several of the above mentioned contracts (there are seven in all) will be finished by the end of the present year. The contract for the section of Canal in the vicinity of Campbellford, which has been awarded to Messrs. Haney, Quinlan & Robertson, is the heaviest undertaking on this division, and it may be two or even three years yet before it is completed and before boats may be able to travel from the land-locked waters of Lake Simcoe to the broad expanse of Lake Ontario.

It should be mentioned also that the locks now under construction on the division extending from Trenton to Healey's Falls and in fact extending up to Peterborough are being built so as to provide for an 8 ft. 4 inch draft. This will accommodate barges of 1,000 tons. It is intended that ultimately the entire Canal will be deepened to accommodate vessels drawing 8 ft. 4 inches of water with a minimum depth of nine feet between the locks.

However, even with the completion of the work at present under contract between Healey's Falls and Trenton through navigation will not be afforded from Georgian Bay to Lake Ontario. There is yet to be placed under contract the section extending from Lake Simcoe to Georgian Bay, a distance via the Severn River of 30 miles. The work on this section of the Canal is not considered very heavy, consisting of the building of five or six locks and dams. The advocates of the early completion of the Trent Canal are hopeful that the Government may place this section under contract within the next twelve months so that it may be finished concurrently with the Healey Falls-Trenton Division (officially known as the Ontario-Rice Lake Division), thereby completing within the next few years a Canal that will afford a water route from Sault Ste. Marie to Montreal shorter by 250 miles than that by the Welland Canal.

The Ontario-Rice Lake Division

IN the annual report of the Department of Railways and Canals for the year ending March 31st 1910 being the latest annual report of the Department to hand is found some very interesting information concerning the nature of the work that is now in progress in making the River Trent navigable for vessels of 8 feet 4 inches draft from completing the southern outlet of the Canal. Mr A J Grant Superintending Engineer who is in charge of the work, says

This division embraces the fifty six and a half miles of the river route between Trenton on Lake Ontario and Rice Lake, which will comprise when completed nine and a half miles of canal thirteen miles of submarine channel and thirty four miles of deep river whose average width will be about 500 feet. The rise between extreme low water level of Lake Ontario and normal navigation level of Rice Lake is 368 feet which rise will be overcome by 18 locks ranging from 9 to 27 feet in height. Fourteen concrete dams with stop-log sluices, will be required for the regulation of the river and at them 75 000 h p gross may reasonably be developed at the low water stage of the river but this quantity may be increased somewhat by a larger expenditure in tail race excavation. The normal navigation level of the natural reaches of the river and Rice Lake will be that of ordinary summer level, so that practically no damage will be done by flooding the land along the river and lake shores. In the rapids the dams will hold the river at as high a level as practical which, in the majority of cases, will be lower than the top of the river banks. The canals and channels with sides showing above water will have a minimum bottom width of 90 feet except in two cases of short canals above locks where the bottom width will be only 50 feet and the submerged channels will have a minimum bottom width of 100 feet which will be marked at frequent intervals by small piers. The canals and submarine channels will have a depth of 9 feet.

There will be sixteen bridges, ten of which will be for highways and six for railways. They will all be swing or bascule spans, except that for the main line of the Grand Trunk Railway at Trenton Junction which will be a high level fixed bridge under which there will be a clear head room of 27 feet at a stage of high water in Lake Ontario.

The locks will be of concrete and will have 8 feet 4 inches of water on the sills with chambers 33 feet wide by 175 feet long between hollow quoins. They will accommodate barges of 1,000 tons whose size will be about 150 feet long by 30 feet beam and drawing 8 feet of water. Entrance piers of not less than 150 feet in length will be provided above and below each lock. The locks will be filled through culverts 4 feet wide by 5 feet high in the side walls which will be equipped with wagon valves for controlling the water. The lock gates will be of the solid timber type and the upper gates in all cases will be set on the top of lift walls. They will be operated by struts or bars working in hand power winches set in recesses which will be formed in the lock walls.

The total cost of the improvement of this part of the Trent Navigation will amount to about $5 750 000 the first vote for which was made by Parliament during the session of 1907. The project involves the removal of about one and a half million cubic yards of earth, one and a quarter million cubic yards of loose and solid rock and the building of about four hundred thousand cubic yards of concrete.

As to The Future

THE advocates of the construction of the Trent Canal as a means of through navigation from Lake Huron to Lake Ontario are to-day more than ever convinced that when the waterway is completed it will be an important factor in the grain carrying trade between the great west and the Atlantic sea board. While it has up until a few years ago received very little support from the large industrial centres of Canada not situated upon its route and which may not derive any immediate benefits from its completion, it is to-day, with the great increase of wheat production and transport necessity, generally speaking, receiving the hearty support of every section of the Dominion of Canada. The present Minister of Railways and Canals, Hon. G. P. Graham, has displayed keen interest in the project, and the work of completing the waterway has proceeded, under his administration, with greater vigour than at any time in its history. A certain section of the press of Canada too has at times been more or less hostile towards the project, but those who have for years fought so determinedly in its behalf are hopeful that in a few years hence they will see barges laden with grain from the great West passing down its course.

The old Erie Canal, with its draft of slightly more than five feet, can hardly in the matter of carrying capacity be compared with the Trent Canal, with its draft of 8 feet 4 inches, yet the advocates of the Trent waterway point with pride to the part the Erie Canal has played in the transportation interests of the United States. It is pointed out that the inestimable benefits which have been derived from the Erie Canal in the past are not disputed by any one. To it, more than to any other one cause, is due the phenomenal growth and commercial supremacy of the City and State of New York. It opened up the great West to settlement and in turn attracted the products of the West to the low grade line through the Appalachian chain, which exists only in the State of New York. The tolls on this waterway have more than repaid the cost of construction, maintenance, and operation. In addition it has paid over $350,000,000.00 of freight money within the limits of the State, and the disbursement of this money along the line of the Canal has built up the great interior cities from Boston to Albany, forming a continuous line of commercial centres which has no counterpart in any other State. The growth of these Cities in turn led to the construction of railways paralleling the Canal, and these, by consolidation and scientific management, have gradually reduced the cost of transportation, with all the advantages such a reduction necessarily brings. With the completion of the Trent Canal not only will transportation rates generally be reduced to points along its route, but a good percentage of the grain that passes through the "Soo" Canal on its way from the West will be conveyed in barges, by way of the Trent, to Montreal and the seaboard.

One of the ablest speeches that has ever been delivered on the practicability and desirability of the Trent Canal and its possibilities as a factor in through transportation, was made by Mr. R. R. Hall, who some four years ago represented West Peterborough in the Dominion House of Commons. Mr. Hall, who had given the Trent Canal and its future a most careful study, in addressing the House on the matter, amongst other things said:

"The consumption of coal in the City of Peterborough last year was 43,430 tons. The rate on coal from Suspension Bridge to Peterborough by rail is $1.25 a ton. Coal is delivered at Oswego at 15 cents a ton cheaper than at Suspension Bridge. Freight between Oswego and Trenton or Port Hope is 25 cents a ton, and the rate between Port Hope and Peterborough by rail, though only a distance of 30 miles, is 50 cents a ton. On coal alone, the freight from Trenton to Peterborough, were the Canal completed, would not be more

Hinclem

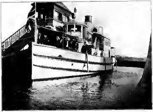
than 25 cents per ton. On that basis there would be a clear saving on coal to Peterborough of 75 cents a ton, or, on the amount consumed last year, a total saving of $32,500."

After dealing very exhaustively with the project, Mr. Hall concluded by saying:

"When you take into consideration the fact that we have the means right in the very heart of the Province of Ontario of establishing a 750 ton barge Canal, which will have a capacity of carrying practically two and a half times the trade of grain from Midland to Montreal, I think you will admit that it is a matter deserving of the most serious consideration, and that the Canal is a work which should be immediately gone on with, as part of our national system of grain transportation."

It will be observed that Mr. Hall referred to the Trent Canal as a 750 ton barge waterway. Since that time the Government decided on building the new sections of the Canal with a draft of 5 feet 4 inches on the lock-sills, thereby providing for the use of 1,000 ton barges. The Ontario-Rice Lake section of the Canal is being built with an 8 feet 4 inches draft, and any renewals that may be made from time to time on the older portions of the Canal will be on the same scale.

A SMALL SECTION OF STONEY LAKE



THE GOVERNMENT [illegible] F. BUTLER TAKING MR. WILLIAM JENNINGS BRYAN OVER THE PETERBOROUGH HYDRAULIC LIFT LOCK. MR. BRYAN MAY BE SEEN STANDING OVER THE WORD BUTLER

As To Power Development

The Trent Canal as a producer of electrical power is doing much towards the industrial development of this section of the province of Ontario. Roughly speaking, the various dams along the line of the Trent Canal from Lake Simcoe to Trenton are capable of developing 100,000 electrical h.p. Of course all the dams are not at the present time developed, for the reason that the district is not as yet able to handle all the power that is in sight. However, the demand is rapidly increasing and new dams along the canal are each year being developed, and the towns and villages for many miles adjacent thereto are being supplied with light and power at as low rates as the Niagara district, which is supposed to have the cheapest light and power in the province.

Every available water power along the route of the Canal, with one or two exceptions, has been acquired either by municipalities, or by private companies. The ownership of these powers was acquired many years ago, and in constructing the canal riparian rights were a matter that gave the Government considerable difficulty. However, all matters of this kind are now adjusted, and while the Government does not receive a revenue from all the water powers on the Canal, certain dams, however, which were taken over by the Government and improved, are revenue producers in so far as the Government is concerned. The lease provide for the use by the power companies of the surplus water after the interests of navigation have been served. It is estimated that the rentals for surplus water at various dams will, when fully developed, yield a revenue to the Government of Sixty or Seventy Thousand Dollars per year.

The following tables give the location of the dams, with their respective lifts and hydraulic power, on the line of the Trent Canal.

FROM LAKE ONTARIO TO RICE LAKE

	H. P.
DAM No. 1.—1.7 miles from Trenton Junction. 17.5 ft. head. At extreme low water of Lake Ontario a head of 20.8 ft. can be obtained. With a 17.8 ft. head the amount of h.p. developed is	8,977
DAM No. 2.—3.4 miles from Trenton. 20 ft. head	4,545
DAM No. 3.—At Glen Miller, 4.8 miles from Trenton. A 23 ft. head can be developed here only with the consent and in conjunction with Messrs. Miller Bros., Limited, who are now using a head of 9 ft. In the event of Messrs. Miller Bros., Ltd., not consenting a head of only 13 ft. can be obtained. A 23 ft. head would produce	6,132
DAM No. 4.—5.3 miles from Trenton, having a head of 18 ft.	4,090
DAM No. 5.—6.0 miles from Trenton, having a head of 18 ft.	4,090
DAM No. 6.—At Frankford, 5.5 miles from Trenton. 16 ft. head. The surplus water at this point is owned by The Trent River Paper Company. There is developed here	3,636
DAM No. 7.—At Glen Ross, 24.2 miles from Trenton. By a large expenditure of money a head of 8 ft. at this dam could be obtained. During high water the present head of 6 ft. at this dam may be somewhat reduced. A 8 ft. head would produce	1,136
DAM No. 8.—At the foot of Myers Island, 26.4 miles from Trenton. A 30 ft. head can be developed at this dam by the excavation of about 25,000 cubic yards of rock for a tailrace, and a 26 ft. head can be obtained at a still greater cost for tailrace excavation in rock. There is a 20 ft. head available without any tailrace excavation. A 20 ft. head would give	4,687
DAM No. 9.—At the head of Myers's Island. There is a 21 ft. head available without any expense in tailrace excavation. With considerable tailrace excavation a 24 ft. head can be obtained, which would develop	3,484
DAM No. 10.—At Ranney's Falls, just below Campbellford, and 30.8 miles above the town of Trenton. A 48 ft. head is in course of development in the vicinity of Lock No. 12	15,000
DAM No. 12.—Known as Stephen's Rapids, just above the Town of Campbellford. The power at this point is developed by the Seymour Power Company. There is a head at this point of 20 ft. Amount of power developed	4,227

DAM No. 12.—At foot of Crow Bay. This power is developed by the Municipality of the Town of Campbellford. The head is 16 ft. Power developed is — 6,681

DAM No. 13.—At Healey's Falls, 14 miles below the Village of Hastings. A head of 70 ft. can be obtained at this dam by the expenditure of considerable money in tailrace excavation. This is considered the most valuable water power on the entire Trent system, and is under lease to the Seymour Power Company (The Electric Power Company, Limited). It is not yet developed, but with a 66 ft. head will produce — 11,200

DAM No. 14.—At Hastings, owned and developed by the Fowlds Company. There is a head of 8 ft., which is slightly reduced during the high water season. A 8 ft. head will give — — — — — — — — — — — 1,536

Total amount of h. p. available between Lake Ontario and Rice Lake — 74 400

The flow of the Trent River from below Healey's Falls to Trenton is estimated at 120 000 cubic feet per minute. At Healey's Falls and Hastings the flow of the river is estimated at 90,000 cubic feet per minute.

FROM RICE LAKE TO STONY LAKE

DAM AT LOCKS just below the City of Peterborough. This dam is not developed. It has a head of 3 ft. at low water, but during the high water season this almost disappears, hence the power is of little value. However, if a head of 3 ft. could be maintained and taking the flow of the river at 90 000 cubic feet per minute, the amount of power available would be — 1,000

DAM AT LONDON STREET, Peterborough, owned and developed by the Peterborough Hydraulic Power Company (The Quaker Oats Company) — 2 400

DAM AT AUBURN, owned and developed by The Peterborough Light and Power Company (The Electric Power Company, Limited) — — — — 1 900

DAM KNOWN AS WATERWORKS DAM, just above City of Peterborough, owned and developed by the City of Peterborough — — — — — — 1 500

NASSAU DAM, owned and developed by The Canadian General Electric Company — 1,000

DAM No. 6, Peterborough Lakefield Section. Leased to and developed by the Otonabee Power Company. This dam along with No. 4 a short distance above, can be jointly developed to provide — 4,000

DAM No. 3.—Leased to and developed by the Canada Cement Company — — — 1 400

DAM No. 2.—Not yet developed, owned by the Dominion Government — 1,500

DAM No. 1.—Owned and developed by The Dickson Company of Peterborough — 2,500

DAM AT YOUNG'S POINT—Owned and controlled by the Canada Cement Company — 143

Total h. p. on this section — — — — 19 500

In the estimate of the amount of available power on this section, the figures furnished by the Ontario Hydro Electric Commission are used, with the exception of the estimate on the dam just below the City of Peterborough and the Young's Point Dam. The Hydro Electric Commission's estimate on the dams from Peterborough to Lakefield is considered to be very conservative, the flow of the river being reckoned at 84 000 cubic feet per minute. It is pretty generally conceded that the low water flow of the river from Clear Lake to Rice Lake is 90 000 cubic feet per minute.

FROM STONY LAKE TO CAMERON LAKE

BURLEIGH FALLS DAM.—Owned by The Electric Company (The Central Ontario Power Company). There is a head here of 26 ft. Taking the flow of the river at 90 000 cubic feet per minute the amount of power that may be developed will be — 3,000

BUCKHORN DAM.—Owned by the Electric Power Company. Not yet developed. A head of 10 ft. Taking the flow of the river at 90 000 cubic feet per minute, the amount of power available here would be — 1,750

BOBCAYGEON DAM.—Taking the flow of the river at 70,000 cubic feet per minute, with a 10 ft. head, the amount of power available is — 1,260

FENELON FALLS DAM.—The surplus water at this dam is owned and developed by the Light Heat and Power Company of Lindsay. The head here is 24 ft., and the flow of the river is estimated at 45,000, giving electrical h. p. to the extent of — 2,340

The total amount of h. p. on this section therefore is — — — 8,350

8850

Few people realize that the 100 000 electrical h. p. capable of being developed along the Trent Canal from Balsam Lake to Trenton is equal to 1 000 000 tons of coal for which we are paying the United States four million dollars annually.

The 100,000 electrical h. p. above referred to does not include the power developed on the Severn River, which flows from Lake Simcoe to Georgian Bay.

VIEW OF RIVERVIEW PARK, TAKEN FROM STREET RAILWAY WHARF, PETERBOROUGH

VIEW OF THE PETERBOROUGH SIDE OF THE OTONABEE, TAKEN FROM RIVERVIEW PARK, SHOWING PETERBOROUGH WHARF AND STREET RAILWAY LINE

ANOTHER VIEW OF RIVERVIEW PARK, TAKEN FROM THE TERMINUS OF THE STREET RAILWAY

As a Tourist Resort

THE route of the Trent Canal consists of a chain of lakes and rivers unsurpassed on the Continent in their varied attractiveness as tourist resorts. It is only within recent years that these picturesque waters have been commercialized in the matter of being advertised as tourist resorts but to-day there is not one available point or island on the lakes and rivers throughout the entire system that is not dotted with pretty summer homes and comfortable hotels maintained almost exclusively for the tourist traffic. The growth in the popularity of these waters as an ideal spot to spend the summer months has been really astonishing and to-day they are receiving a degree of advertising by railway companies equal to that given the much older established, but no more attractive, resorts such as the Thousand Islands and Muskoka.

A certain section of the Trent Canal is commonly known as the Kawartha Lakes. "Kawartha" is the Indian word for "Bright Waters and Happy Lands." They comprise fourteen beautiful lakes—Scugog, Sturgeon, Cameron, Balsam, Pigeon, Bald, Sandy, Buckhorn, Chemong, Deer, Lovesick, Stony, Clear and Katchewanooka—to which may also be added Rice Lake, twenty-one miles down the Otonabee River below Peterborough.

The altitude of these famous lakes lends them additional charm for the tourist and pleasure seeker, some of them being 830 feet above sea level, over 600 feet higher than Lake Ontario, and 300 feet higher than Georgian Bay. On these charming waters the pleasure seeker will find delightfully cool wooded shores and sandy beaches, where bathing may be indulged in with safety.

The accommodation for travellers at the various points on these waters is much superior to the average summer resort. For those who wish to take their family for an outing, the cottage or camp on the shores of these waters affords a vacation at a very moderate expense. The hundreds of miles of shore and the many islands of the Kawartha Lakes specially lend themselves to the enjoyment of a summer outing. The Kawartha Lakes being on the line of the Trent Canal are linked together by narrows, locks and channels which allow the boat of the pleasure seeker to pass from one to another until the whole chain is explored. The eye never has time to weary of one scene before the rounding of a point, the passage of a lock or the threading of the narrows puts before you a new prospect. The dip of an oar, the stroke of a paddle, the twist of a tiller or the turn of a pilot wheel is enough to bring a fresh section of the Kawartha panorama into view.

These Highland Lakes of Ontario are like and yet unlike the Scotch lochs. They do not possess the awful grandeur of those of Switzerland nor the cold ruggedness of some of the Scotch lochs, yet there is about them an inspiration more subdued and peaceful, while every point and island, every bay and headland glows with a sweetly picturesque beauty. Slowly threading a narrow passage between verdure-laden isles, the rounding of a point will suddenly bring into view a broad expanse of water whose continuous shores seem to have no outlet, but hidden behind some island or projecting headland will be found a passage leading through another labyrinth of beautiful scenery, and just as further progress seems impossible another miniature sea breaks on the view.

Lovely as were the Kawartha Lakes when Nature displayed them to advantage before the enthusiastic glance of Samuel de Champlain and his Indian allies, yet now with all that Nature then did improved by the artistic hand of man, they are simply enchanting. Travellers in Scotland, or readers of Sir Walter Scott's or other descriptive works of "The Bonnie Highlands," are not unfamiliar with the wild grandeur of the Scotch lochs, and all this magnificence is reproduced within the compass of the Kawartha Lakes. The more the scenery is studied, the more convinced one becomes that the charms which are spread out under a Canadian sky can vie with the most lovely which are scattered under distant climes. The student of geology, the botanist and the amateur photographer find a field well worth while in the Kawartha country.

As for the canoeist, this midland district of Ontario is one broad, continuous network of lakes extending to James Bay, and the voyages to be taken by the enthusiastic lover of the canoe have but one limit—the time at the disposal of the voyager.

The Hydraulic Lift Locks

IN attempting to describe the hydraulic lift locks on the Trent Canal we can not do better than to reproduce a few extracts from a paper prepared by Mr Walter J Francis C E (Tor Univ) M Can Soc C E Mr Francis at the time of the construction of these locks, was in the service of the Department of Railways and Canals and had immediate charge of the work. In January 1907 Mr Francis read a paper at the annual meeting of the Canadian Society of Civil Engineers, at Toronto, his subject being "Mechanical Locks in Canada." While space will not permit of our using the article in its entirety it is hoped that the extracts taken therefrom and published below will give the reader some slight idea, at least of the hydraulic lift locks on the Trent Canal. Mr Francis said in part

"Built for the Canadian Government by Canadian contractors, under the direction of Canadian engineers, the hydraulic locks on the Trent Canal may properly bear the label "Made in Canada." In view of the fact that the German Government has recently completed a high canal lift at Heinrichenburg, and that the United States Government has made a careful study of the problem of mechanical lifts in connection with the reconstruction of the Erie Canal, a detailed description of the Canadian hydraulic locks may be considered appropriate at the present time.

The larger of the two Canadian locks is situated on the Trent Canal within the limits of the corporation of the city of Peterboro and has been in operation since June 1904. The other lock, near the village of Kirkfield is in a stretch of canal joining Balsam Lake and Lake Simcoe.

"The hydraulic lock is theoretically an automatic machine and is designed to take the place of ordinary locks where a great difference of level is found in a short distance. Besides the Peterborough and Kirkfield locks there are three other locks of this type in operation, one being in England, another in Belgium and the third in France. The English lock has been in continuous use for over thirty years, while those in France and Belgium have been completed about twelve years. They all have a lift of nearly fifty feet. The depth of water in the French and Belgian locks is 7 feet 10 inches, and the lock chambers are 140 feet long and nineteen feet wide. Several others having similar dimensions are now being built by the Belgian Government. The chief dimensions of the Peterborough Lock are 65 feet lift, chambers 140 feet long, with 33 feet clear width and 8 feet normal depth of water. The Kirkfield lock has the same general dimensions with a lift of 50 feet. It will be noticed that in the Peterborough lock the water load is double that of the larger European ones while the height of the lift is increased over thirty per cent.

"In principle the hydraulic lock may be likened to two immense hydraulic elevators of the simple plunger type, having their presses connected together so that the descent of the one causes the rise of the other. In place of the ordinary elevator platform we have a large watertight box or tank closed at either end by a gate. The lockage is performed by towing the vessel into the box of water and then closing the gate on the end of the box as well as that of the end of the canal, thus leaving the box independent of the reach and free to move vertically. The box with the water and the floating vessel is then raised or lowered to the other reach. The chamber or box about to descend is loaded with a few inches more water than the other chamber thus giving it the necessary additional load or "surcharge" to enable it to cause the ascent of the other when water communication is established between the two presses. The construction of the Canadian locks varies materially from those of Europe and as far as outward appearance goes there is little similarity. The departures are largely due to the climatic conditions and to the different practices adopted by American and European engineers in steel construction.

"For purposes of detailed description, the Peterborough lock will be taken first and the differences in the Kirkfield structure will be noted later in the paper.

THE PETERBOROUGH HYDRAULIC LIFT LOCK FRONT VIEW

THE PETERBOROUGH HYDRAULIC LIFT LOCK FROM THE WEST

A gradual slope was selected for the site of the Peterborough lock and the excavation was completed in 1899. The location was chosen so that the average depth of excavation was about 40 feet and the material thus obtained was used in building embankments to carry the level of the upper reach to the back of the structure. The excavated material was found to be hard clay mixed with small stones and boulders underlying a thin layer of fertile soil. At the upper end of the excavation a small amount of hardpan was encountered and below this a shaly limestone rock. The rock was in layers of from ½ inch to 8 inches in thickness between which were thinner layers of clay and shaly material. The layers of crystallized limestone stand the weather quite well but the shaly parts disintegrate very rapidly under the action of rain and frost. The elevation at which rock was found was exceedingly fortunate being practically at the bottom of the pits. When the rock was cleaned off less than two feet of concrete brought the floor to its proper grade. No footings were required under any of the walls, all being built upon the solid rock.

After dealing in detail with the excavation of the press wells in which the large presses stand Mr. Francis' paper gives a description of the substructure of the lock. It is built entirely of concrete and contains a little over 26 000 cubic yards. The breast wall is forty feet thick and 80 feet high the length being 126 feet at the base. The towers, three in number are on the same transverse centre line as the walls. In round numbers, the total height of each tower from rock bottom to top is 100 feet.

"The earth embankment upon which the canal is carried up to the back of the breast wall was built in layers about 8 inches in thickness, thoroughly compacted and rolled. During the hot and dry season the earth filling was liberally watered. The material was clay containing small stones. This method produced an embankment having the remarkable record for settlement of only about 1·40 foot in a period of nearly a year where the depth of made earth was upwards of forty feet.

"The contract for the embankment and substructure was executed by Messrs. Corry & Laverdure of Ottawa and completed in 1902."

Dealing with the superstructure Mr. Francis says:—

"The superstructure of the Peterborough lock was built by the Dominion Bridge Company of Montreal. The work was commenced in the summer of 1901 and the structure was completed early in July 1904. The cost of the superstructure complete was $244 000 00.

"Each of the lock chambers is 139 feet x 33 feet with 8 feet 10 inches of plating on the sides. These dimensions, with the exception of the depth of water were fixed by a Government Commission. It is also necessary that a clear headway of 25 feet be left above the water level. The depth of water for which the lock is constructed would in ordinary navigation language be called 8 feet on the sills. The load of water which each of the lock chambers contains is 1 300 tons and this is the maximum load which it is necessary to provide for since a floating vessel displaces only her own weight of water."

The structural steel work was minutely described by Mr. Francis as well as the gates and their mechanism and the main presses and rams. After manufacture and before erection all the castings of the presses were subjected to a tight hydraulic test at a gauge of 1 200 lbs. per square inch being twice the working pressure.

As to the materials and general appearance Mr. Francis says—

"A summary of the amounts and various kinds of metal used in the superstructure is as follows:—Rolled steel in plates and shapes for the lock chambers and gates 1 640 000 lbs.; cast iron in rams accumulators guides and various machines 495 000 lbs.; steel castings for the main presses and accumulator 569 000 lbs.

"Care has been taken throughout to make the general appearance of the work as attractive as possible. All the walls and stairways are protected by suitably designed railings and the windows and doorways are closed by ornamental grille-work. The lockmaster's cabin on the top of the centre tower is constructed of concrete as high as the window sills. Above this the steel frame work is furred with wood, and the whole of the exterior covered with copper. The interior is finished in British Columbia cedar in the natural color."

Many people who visit the hydraulic lift locks and see them in operation are at first puzzled to know how the space between the lock chamber and the frame of the reach gate is made water tight. Mr. Francis explains this thus:

"There is a space of nearly 2 inches between either end of the lock chamber and the frame of the reach gate. When it is desired to connect the lock chamber with a reach this clearance space has to be closed. This is done by having a collapsible rubber tube fastened to the frame of the reach gate and arranged so as to lie flat. When the lock chamber is in position for communication, the rubber tube is inflated with air at about 10 pounds per square inch pressure, which causes it to expand and press against the end of the chamber."

The operation of the lock is described by Mr. Francis as follows:—

"The operation of the hydraulic lock requires three men—a lockmaster and two assistants or gatemen. The lockmaster is in charge and is responsible for the structure. Two gatemen are required, one at the lower and one the other at the upper, to open and close the gates, to inflate or deflate the seal tubes, and to operate the capstans. The gatemen also take charge of vessels at about 200 feet on either side of the lock. The lockmaster during operations stays in the cabin on the top of the centre tower and has full view of all that transpires. He is also in communication with his two assistants by a simple signal system. The lockmaster has before him the principal levers, and through an interlocking system regulates the working of the lock. The levers for controlling the gate engines and the capstans are situated on the wall immediately above the respective machines, convenient of access to the gatemen. The interlocking system is so arranged that the lockmaster must set his levers in proper order, and these having been set neither he nor the gatemen can err by using their levers at the wrong time.

"In order to get a clear idea of the complete mode of operation, let us assume that both lock chambers are down at the lower level, empty, as they are at the end of winter, or when it is desired to prepare them for navigation purposes. The annular space in each of the presses if empty will be filled with water. The main valve on the connecting pipe will be closed and water will be pumped into one of the presses until the ram, with its superimposed chamber, rises to the level of the upper reach. An examination of the case will show that it is necessary that the uppermost chamber, in order that it shall be able in descending to cause the other to take the full upward stroke, must contain a volume of water greater than the rising chamber contains. This extra amount is equal to the volume of one of the rams, since the change that takes place during the relative motion of the two chambers is that the ram of the descending chamber becomes constantly immersed while the other protrudes. In other words the descending chamber is losing weight while the ascending is constantly becoming heavier. It is also necessary that some extra weight be provided so as to overcome the friction of the guides and of the stuffing boxes of the main presses. The area of each lock chamber is so great that it requires only an additional depth of 8½ inches to give an extra load of water of 100 tons, which is sufficient for ordinary operation. The addition to this weight will, of course, have the effect of accelerating the time of the relative change in position of the chambers. The ordinary time required in raising the chambers through the whole elevation is about two minutes. But this will depend upon the adjustment of the rams' glands, the nicety of the working of the guides, and the manipulation of the main valve in the hands of the lockmaster.

"An ordinary lockage is conducted in this manner. Suppose 100 tons of surcharge has been found to give sufficient additional weight to the descending chamber. The uppermost chamber will then be stopped in line with its floor 8½ inches lower than the bottom of the upper reach. On communication being established with the reach, it receives from the reach 100 tons more than the lower chamber contains, assuming the depth in both reaches to be the same. Then the total operations to make the lockage, if the gates adjoining the reaches are opened and the seal tubes are inflated consists in hauling the vessel into the chamber and mooring her there securely closing the gates deflating the seal tubes and opening the main valve between the presses. The heavier chamber then commences to descend the motion being allowed to increase gradually by the gradual opening of the valve until it reaches the maximum speed. At about three quarters of the stroke the main valve is slowly closed communication between the presses being entirely cut off when the end of the journey is reached. The change in elevation being made, the seal tubes are inflated the gates are opened and the vessel or vessels are free to go on their journey, after being towed out by the capstans. The surcharge contained in the descending chamber simply flows out into the lower reach while a similar quantity to perform the next lockage is admitted into the chamber which has just reached the higher elevation.

The record lockage so far, at the Peterborough lock is 8½ minutes being the whole time from the stopping of the vessel in the lower reach to her proceeding on her journey under her own steam in the upper one.

The Reservoir Waters

THE Trent Canal district may be said to have furnished to Ontario the first real practical demonstration of the value of water conservation. While the Trent Canal has been heard of for many years and has in its day constituted a sort of political football with which perhaps both of the great political parties have played, it is, at the same time, as a canal, a waterway for the transportation of the products of the country, that it has been advocated and to which it has invariably been referred. This waterway which when completed will run through the midland counties of Ontario, connecting Georgian Bay with Lake Ontario at Trenton, constituting a route for barges of 8 feet 4 inches draught fully 250 miles shorter to Montreal than by the Welland Canal, is in reality nearing completion. It will therefore be a matter of a short time only until the advocates of this route will have an opportunity of demonstrating to the world, if they can, that the Trent Canal, projected nearly 75 years ago, can carry grain from Midland to Montreal at cheaper rates and in faster time than by the Welland route.

However, it is not along this line that I am now going to discuss the Trent Canal, but rather as a means by which electrical power has been developed along its route, and the factor it is playing in the industrial development of its district. Next to the Niagara there is no district in older Ontario at least in which the water falls are being developed to a greater degree than along the line of the Trent Canal. There has been a number of small private dams on this waterway for many years back, in which power has been to a limited extent developed. It has been during recent years only, however, that the great possibilities of power development on the Trent Canal have been fully realized. Efficient and modern power houses are now looming up at the various dams, and the district thereabout is becoming a net work of power transmission lines.

This is due to two main reasons. Firstly, it might be stated that the final adoption that the route the Canal should take at certain points, and the erection of substantial new concrete dams by the Dominion Government for Canal purposes, made many valuable sites available for the development of power. These dams are at the present time practically all acquired. Most of them are already being used in the development of electrical energy and the remainder of them are about to be utilized. They are owned by various private persons, joint stock companies and municipalities. The nature of the titles to, and power privileges in connection with, these dams vary considerably. Some of them are owned outright by private individuals and they are entitled to all the surplus water without any yearly rental. The dams thus held were secured many years ago, either before a canal was seriously thought of, or before the value of water powers was understood. Other dams are merely leased from the Government (the terms of the leases varying) upon payment of a certain annual rental being based, of course, upon the amount of power developed. Such dams as these are now placed under the control of the Railway Commission in so far as the matter of rates to consumers of power is concerned. This was a very wise move on the part of the present Minister of Railways and Canals, as it ensures to the public the delivery of power at a reasonable price.

But the remarkable development of electrical power on the Trent Canal is not due to this alone. The flow of the Otonabee and Trent Rivers, on which the great portion of the power is developed, has, by a judicious and aggressive policy of conservation, been increased to such an extent that it has contributed perhaps to a greater degree than the construction of new dams to the present highly satisfactory state of affairs, and has indirectly also contributed to the development of the towns and villages along the route of the Canal. When it is realized that the flow of the Otonabee River at Peterborough has increased over 100 per cent during the past five years, one can realize that water conservation on the Trent Canal has been a reality.

Until five years ago the waters of the Trent Canal and the waters of what is known as the Trent Canal watershed were under separate management. That is, the main lakes and rivers that come into the Trent Canal proper were under the control and management of the Dominion Government, while the "feeders" thereto were under the control of the Government of the Province of Ontario.

It must be borne in mind that the County of Haliburton and those portions of the counties of Peterborough and Victoria north of the main line of the Canal contain almost countless lakes of various depths and sizes. A glance at a map drawn on a reasonably large scale, on which these lakes are shown, would undoubtedly surprise one who is not personally familiar with the locality. Some of these lakes are quite large, Redstone, for instance, in the township of Guilford, having an area of 3,081 acres; Kennisis, in the township of Havelock, having an area of 3,835 acres, and Gull Lake, in the township of Lutterworth, having an area of 2,748 acres. These lakes empty into various streams that finally discharge into the Trent Canal. The two of the largest of these are known as the Gull River, which flows into Balsam Lake at Coboconk, and the Burnt River, which flows into Cameron Lake, just above Fenelon Falls.

However, there are other streams that are valuable as "feeders" to the Trent Canal, a full list of which, together with the areas, in acres, of their basins, is as follows:

	ACRES		ACRES
Gull River basin	40,864	Deer Bay Creek basin	2,547
Burnt River basin	22,950	Buckhorn Creek basin	955
Nogies Creek basin	1,671	Squaw River basin	341
Mississauga basin	7,002	Jack's Creek basin	4,198
Eels Creek basin	2,683		
		Total	83,211

This does not include the Crow Bay waters, which empty into the Trent River below Healey's Falls. Crow Bay waters are still under the control of the Ontario Government.

During the year 1906 an agitation was started by the power users along the Trent Canal, as well as by the navigation interests, to have the control of above-mentioned watershed, or what is now commonly known as the reservoir waters, transferred from the Province of Ontario to the Dominion Government, in order that there might no longer be a dual system of management in connection with the water that finally passes through the Otonabee and Trent rivers on the main line of the Canal. Until that time the normal flow of the Otonabee River at Peterborough was 44,000 cubic feet per minute. There was no uniform flow of water, for the reason that it was practically impossible under the conditions then existing to control it.

At certain periods of the year—during the spring and early summer—an unnecessary amount of water came surging down the Otonabee and Trent Rivers, while by the month of August there was not enough water to drive the wheels of the various power houses on the Canal, or supply the requirements of the navigation interests. This state of affairs was due to the fact that those in charge of the tributary waters had no interest whatever in these streams other than to assist the lumbermen in getting out their logs. The Ontario Government had built timber dams at the outlets of many of these lakes, which were controlled by the Provincial Department of Public Works. The dams were built and operated in the interests and for the sole benefit of the lumbermen. When the lumberman would drive out of the various lakes, there would be an abnormal and unnecessary flow of water come down into the main Canal. The stop logs would remain out until the following spring, when the same process would be gone through.

It was argued, and quite properly so, that if the entire water of the Trent Canal watershed, together with the water in the main line of the Canal, were placed under one management, a system of conservation could be inaugurated whereby, without any interference with the rights of the lumbermen, a steady and increased flow could be made to pass down the

Otonabee and Trent Rivers at all seasons of the year. It was of course contended that the control should be vested in the Dominion Government in view of the requirements for navigation purposes. After some months of negotiation in which prominent men of the district regardless of political creed took part, the transfer to the Dominion Government was made in July 1905, the Provincial Government handing over all lakes, rivers, and streams tributary to the Trent Canal north of Peterborough. The Dominion Government agreed to protect the rights of the lumbermen in respect of the use of dams on these streams and guaranteed to them all privileges they had hitherto enjoyed.

The Department of Railways and Canals, under whose control this splendid watershed now came, at once got busy. Money was voted for the repair, rebuilding and improving of the dams at the outlets of these various lakes. The old timber dams were in many instances replaced by substantial concrete structures. Others were repaired and tightened, and in mostly every other case the dams were raised by many feet over their former level. On the various streams good, competent, and experienced men were placed to operate the stop-logs at the different dams, and an almost perfect system was built up. The result of the work is thus far most surprising. The water is now conserved in the springtime, the lumbermen's drives are taken out with care, and by using only what water may be absolutely required. The stop logs are immediately replaced after each drive passes out, and the water is bottled up until such time as it may be required in the late summer or fall months, on the main Canal.

The beneficial results are clearly indicated. The flow of the River Otonabee was increased to 30,000 cubic feet per minute, being just twice the flow it was five short years ago. Power development of each dam has correspondingly increased, and more power is accordingly available for distribution throughout the district.

It must be borne in mind that the system is not yet extended to the full limit of its possibilities. Each year more new reservoir dams are being built, and for some years to come there will be scope for still further improvement. An extreme dry spell may, to some slight extent, tax the present greatly increased capacity of the various power plants, yet there is not a power company operating on the Trent Canal, especially from Peterborough down, that will not say that the flow of water in the Trent Canal has been steadier, more uniform, and 100 per cent. greater throughout the entire year than it was five and six years ago.

There is no doubt, therefore, that water conservation in this district has been successful to a most surprising degree. There is no doubt also, that the successful working out of this policy has resulted in great industrial growth which is as yet in its infancy, for the reason that many of the best dams of the Trent Canal are only now being harnessed with a view to supplying the very attractive market which awaits it.

It is only fair to say that the success of this scheme is in a very large measure due to the superintendent of the Canal, Mr. J. H. McClellan, who has given the matter a thorough study, and has maintained throughout that degree of enthusiasm with which he some years ago entered upon the work.

THE KETCHEGUM LAKE HUNT CLUB. KETCHEGUM LAKE IS ON THE TRENT CANAL RESERVOIR SYSTEM

—Thirteen-seven

188,465 Acres of Water

IT may surprise many to know that the area of the various lakes that form that portion of the Trent Canal from Balsam Lake to Trenton is 89 079 acres. To this may be added the area of what is commonly termed the Reservoir Waters and which is 99 359 acres. This therefore would mean that, exclusive of the many fairly large rivers and streams, there are 188 438 acres of water flowing continuously down through the Trent. This area is made up as follows:

RESERVOIR WATERS

	ACRES		ACRES
Gull River basin	40 884	Jack's Creek basin	4 198
Burnt River basin	22 950	Crow River basin	16 149
Nogies Creek basin	1 671	Deer Bay Creek basin	2 547
Mississagua basin	7 002	Buckhorn Creek basin	655
Eel's Creek basin	2 683		
Squaw River basin	341		99 360

	ACRES		ACRES
Balsam	10 300	River Buckhorn to Burleigh and Deer Bay	4 140
Cameron	3 100	Stony and Clear	10 875
Scugog	16 000	Rice	17 000
Sturgeon	9 200		
Pigeon	5 064		
Chemong	5 400		89 079
Buckhorn	8 000	Total	188 438

Of course, Lakes Simcoe and Couchiching, which are on the line of the Trent Canal, have an area of 293 square miles. Their waters, however, flow through the Severn River into Georgian Bay, and after flowing over Niagara Falls join their neighboring waters of Balsam Lake in the Bay of Quinte.

The Crow River basin of 16 149 acres, flows into the Trent Canal just below Healey's Falls. The Superintending Engineer of the Canal, in his annual report to the Department, estimates the low water flow of the Trent River below the point at which the Crow River basin enters at 2 000 cubic feet per second, while at Healey's Falls the low water estimate is 1 500 cubic feet per second.

The Charts Explained

In making a trip over the Trent Canal, yachtsmen and others who may desire to refer to the charts herein, will observe that these charts have been arranged in the following order:

1 Chart of Lakes Couchiching and Simcoe.
(From the entrance to the Canal near Beaverton to Balsam Lake, no chart is required, the channel following the Talbot River for some distance, and the remainder of the distance being through an artificial reach.)
2 Chart of Balsam Lake and Cameron Lake
3 Chart of Sturgeon Lake
4 Chart of Pigeon Lake
5 Chart of Buckhorn Lake and Chemong Lake
6 Chart of Deer Bay and Lovesick Lake from Buckhorn to Burleigh
7 Chart of Stony Lake and Clear Lake
(The channel from Young's Point to Peterborough through Lake Katchewanooka and the River Otonabee is easily located without the aid of a chart.)
8 Chart of Otonabee River and Rice Lake

Height of Locks

The following table gives the location of the locks with their respective lifts on the Ontario-Rice Lake Section now under construction.

NO. OF LOCK	MILES FROM TRENTON	LOCALITY OF LOCK	LIFT OF LOCK
1	1 8	Trenton Junction	20 ft
2	2 4		20 ft
3	3 9	Glen Miller	27 ft
4	5 2		18 ft
5	6 4		18 ft
6	7 3	Frankford	16 ft
7	13 6	Glen Ross	9 ft
8	25 2	Percy Landing	20 ft
9	26 4		16 ft
10	27 8		24 ft
11	29 6	Ranney Falls	24 ft
12	29 6	Ranney Falls	24 ft
13	32 1	Campbellford	23 ft
14	33 6	Middle Falls	26 ft
15	36 1	Crow Bay	22 ft
16	36 5	Healey Falls	27 ft
17	36 5	Healey Falls	27 ft
18	51 0	Hastings	6 ft

It will be seen by the above table that the total lift from Lake Ontario to the reach above the Hastings lock is 360 feet. The new lock at Hastings replacing the old lock built about the year 1837 was thrown open for traffic this spring and there is once again through navigation to Healey's Falls.

The following table gives the location of the locks with their respective lifts on the navigable portion of the Canal from the Otonabee River below Peterborough to Balsam Lake the summit waters of the Trent Canal.

	LENGTH BETWEEN QUOINS	WIDTH	DEPTH ON SILL	LIFT
1 Lock at Peterboro	134 ft	33 ft	6 ft	6 ft
1 Lock at No. 6 Peterboro Lakefield Division	142 ft	33 ft	6 ft	12 ft
1 Lock at Peterboro hydraulic lift lock No. 1	140 ft	33 ft	6 ft	65 ft
1 Lock at No. 5 Peterboro Lakefield Division	142 ft	33 ft	6 ft	14 ft
1 Lock at No. 4 Peterboro Lakefield Division	142 ft	33 ft	6 ft	12 ft
1 Lock at No. 3 Peterboro Lakefield Division	142 ft	33 ft	6 ft	13 ft
1 Lock at No. 2 Peterboro Lakefield Division	142 ft	33 ft	6 ft	10 ft
1 Lock at No. 1 Peterboro Lakefield Division	142 ft	33 ft	6 ft	16 ft
1 Lock at Young's Point	134 ft	33 ft	6 ft	6 ft
2 Locks at Burleigh each 11½ ft (Upper)	134 ft	33 ft	6 ft	
(Lower)	150 ft	33 ft	6 ft	23 ft
1 Lock at Lovesick	134 ft	33 ft	6 ft	4 ft
1 Lock at Buckhorn	134 ft	33 ft	6 ft	9 ft
1 Lock at Bobcaygeon	134 ft	33 ft	6 ft	7 ft
2 Locks at Fenelon Falls each 12 ft (Upper)	134 ft	33 ft	6 ft	
(Lower)	150 ft	33 ft	6 ft	24 ft
1 Lock at Rosedale	175 ft	33 ft	6 ft 4 in	4 ft

It will be observed that the lift from below the City of Peterborough on the Otonabee River to Balsam Lake is 227 feet.

The following table gives the location of the locks with their respective lifts, after leaving Balsam Lake and ascending to Lake Simcoe

	L'GTH B'TW'N HOL. QUOINS	WIDTH	DEPTH ON SILL	LIFT
1 at Kirkfield hydraulic lift lock No. 2	140 ft	33 ft	6 ft	50 ft
1 at No. 1 Simcoe-Balsam Lake Division	142 ft	33 ft	6 ft	21 ft
1 at No. 2 Simcoe-Balsam Lake Division	142 ft	33 ft	6 ft	14 ft
1 at No. 3 Simcoe-Balsam Lake Division	142 ft	33 ft	6 ft	14 ft
1 at No. 4 Simcoe-Balsam Lake Division	142 ft	33 ft	6 ft	14 ft
1 at No. 5 Simcoe-Balsam Lake Division	142 ft	33 ft	6 ft	11 ft

It will be observed that Lake Simcoe is 124 feet lower than Balsam Lake

The Cost of Construction

The following table shows the amount spent each year and the total amount spent to the 31st March, 1910, on the Trent Canal chargeable to Capital Account

Government expenditure prior to Confederation	$ 309 371 31	1895	53 907 70
1880	561 50	1896	302 676 08
1881	——	1897	486 575 70
1882	——	1898	351 273 31
1883	46 767 16	1899	166 611 46
1884	120 393 61	1900	334 583 01
1885	121 383 84	1901	284 503 89
1886	75 103 30	1902	449 075 45
1887	179 541 63	1903	523 980 74
1888	114 870 35	1904	469 038 44
1889	47 592 13	1905	333 261 75
1890	58 044 50	1906	316 780 46
1891	8 826 49	1907	153 065 42
1892	4 457 26	1908	343 176 05
1893	3 582 47	1909	1 009 836 38
1894	3 412 32	1910	1 000 000 00
		Total	$7 873 501 09

Some Distances

The following table of distances on the Trent Canal may be found both useful and interesting.

ON MAIN LINE OF CANAL	MILES
Port Severn to Washago via Severn Bridge	31.0
Washago to Narrows	10.0
Narrows to Gamebridge	18.0
Gamebridge to Balsam Lake	19.0
Balsam Lake to Rosedale River	5.6
Rosedale Bridge to Fenelon	4.8
Fenelon to Bobcaygeon	14.5
Bobcaygeon to Buckhorn	16.8
Buckhorn to Burleigh	7.0
Burleigh to Young's Point	9.0
Young's Point to Lakefield	5.0
Lakefield to Peterborough	10.0
Peterborough to Rice Lake	21.0
Rice Lake to Birdsall's	12.0
Birdsall's to Hastings	4.0
Hastings to Trent Bridge	8.0
Trent Bridge to Healey's Falls	6.2
Healey's Falls to Campbellford	8.15
Campbellford to Chisholm's	17.5
Chisholm's to Frankford	8.4
Frankford to Trenton	7.5
ON CHEMONG LAKE	
Chemong Park to Buckhorn	13.8
Chemong to Bobcaygeon	18.75
ON CLEAR AND STONY LAKES	
Young's Point to	
End of Clear Lake	4.0
Juniper Island Store	8.0
Boschink	9.0
Crow's Landing	12.0
Head of Lake	15.0
Juniper Island to Burleigh	3.36
Crow's Landing to Burleigh	8.5
ON OTONABEE RIVER	
C.P.R. Bridge to G.T.R. Bridge (Peterboro)	1.20
Wolfe St. Wharf to lower end of Peterboro Lock	1.40
Wolfe St. Wharf to Rye's Boat House	1.78
Lower End Peterboro Lock to Crawford's Grove	1.37
Wolfe St. Wharf to Crawford's Grove	2.77
Wolfe St. Wharf to Hale's Bridge	0.90
Peterboro Lock to Hale's Bridge	6.40
Hale's Bridge to Beaufort Bridge	3.80
Wolfe St. Wharf to Wedlock's	18.70
Wolfe St. Wharf to Jubilee Point	21.20
Wolfe St. Wharf to New Cut	21.00
Beaufort Bridge to Wedlock's	5.00
Wedlock's to Jubilee	2.50

HORSESHOE LAKE DAM ON GULL RIVER
THIS IS ONE OF THE RESERVOIR DAMS ON THE TRENT CANAL WATERSHED

THE FOURTH BRIDGE
THIS IS A CONCRETE ARCH BRIDGE OVER THE TRENT CANAL ON THE BALSAM LAKE-LAKE SIMCOE SECTION

FACULTY OF ARCHITECTURE
LANDSCAPE AND DESIGN
LIBRARY
UNIVERSITY OF TORONTO
230 COLLEGE STREET
TORONTO, ONTARIO M5T 1R2

ORILLIA

IN view of the commercial importance of the construction of the Trent Valley Canal, it is natural that the attention of those interested in this great project should be riveted on the Town of Orillia, which is rapidly becoming the great Industrial Centre of Northern Ontario. Orillia, which is situated on the western shore of Lake Couchiching and which also overlooks Lake Simcoe, has quickly developed into a town of importance. Its location and the push, enterprise and energy of the townspeople have been the chief elements to make it what it is. Orillia is a progressive, picturesque and healthful town of six thousand five hundred people. Not the least of her great advantages is her easy accessibility and her excellent railway and transportation facilities. Three great Railways now run through the Town, The Grand Trunk, The Canadian Pacific and The Canadian Northern, which will mean rapid development for her industries, as transportation rates will be the closest and the best. As an example of the enterprise of her citizens, Orillia was the first Municipality in Ontario to develop a Water Power and install an Electric Power Transmission Plant, which was done in 1900 at the Severn River, and all her industries are now run by electricity. A low and special rate is offered to all industries, and many of these have been brought here through this attractive power rate. From this Plant twenty-two hundred horsepower is being used at the present time for Municipal and Manufacturing purposes, and one thousand horse power is now being added. There are one thousand men employed in the various factories. The Tudhope Motor Company employ three hundred men. The Tudhope Carriage Company, two hundred. The Canada Refining and Smelting Company installed their new plant in the town in the fall of 1910, and are now enlarging their plant to at least double its capacity. The Canada Wood Specialty, The Long Manufacturing Company, The Eaton Planing Factory, together with various other Manufacturing Concerns, are all running to their full capacity, and contemplate extending their plants. These and other industries have meant growth for the town, and during the last year the population increased by more than seven hundred. Building of various kinds is going on in every direction, and it has been carefully estimated that over one quarter of a million dollars worth of building and improvements will be done within the town limits during this season. The optimist expects Orillia to outgrow her town status during the next five years and to have become the Industrial City of Northern Ontario.

From a Summer Resort standpoint the town is well known and her principal charms arise from her situation on the two beautiful lakes, Couchiching and Simcoe. Lake Couchiching is about thirteen miles in length and five miles in width, and contains many beautiful islands. The whole region is full of scenic beauty and is a delight to all lovers of nature. One of the principal attractions of the town from a Summer Resort standpoint is its splendid fifteen acre lakeside park, known as Couchiching Beach Park, which also forms the recreation ground for the townspeople and tourists. Boating is one of the favorite pastimes in Orillia, and fair canoeists, sturdy oarsmen, sailing craft, and motor boats are everywhere in evidence. Tennis has many devotees and tennis courts are found on many of the citizens' lawns. For those fond of golf there are excellent golf links, and these are patronized daily by a large following. Orillia is a town of well shaded streets, of exceptionally fine homes, of beautifully kept lawns and of fine churches, schools and town buildings. On the shores of the lake are situated the summer homes of people from Canadian and American cities. Some come from as far south as New Orleans.

Orillia, with the two fold advantage of being an industrial and railway centre, as well as summer resort, must become one of the most important towns along the route of the Trent Canal. Lakes Simcoe and Couchiching form a link in this great waterway system, and both empty into the Severn River, which will be the outlet of the Canal to the Georgian Bay. Surely such a grand location on the junction of the Trent Canal and the three Transcontinental Railways must give promise of a greater future for the already progressive, attractive and flourishing Town of Orillia.

The Town of Barrie

IS situated at the head of Kempenfeldt Bay, Lake Simcoe, in shape resembling a horseshoe. It is the County Town of Simcoe, Province of Ontario, and has the County Municipal Buildings and Law Courts. BARRIE is on the main line of the Northern Division of the Grand Trunk Railway, 62 miles north of Toronto, and is the divisional point of five branches of the G. T. R. BARRIE has a service of 16 trains arriving and leaving daily and a continuous heavy freight traffic. BARRIE owns and operates its own Electric Light Plant. The price of light per 1000 Watts is 9 cents. An all day service for power purposes at low rates will be quoted to applicants.

BARRIE'S population is 6,500.

BARRIE owns and operates its own Waterworks System, which is managed by a Commission. The supply from Artesian wells is inexhaustible and is absolutely pure, in fact the purest on the Continent, being 8 per cent. above par by analysis. The capacity per day of six hours is 2,000,000 gallons, fire pressure 180 lbs., domestic pressure 80 lbs. The price for single tap flat rate is $3.60 per annum. The price for 1000 gals. by meter is 22 cents downwards.

BARRIE has 25 miles of cement sidewalks and splendid roads.

BARRIE has 6 Banks, 10 Hotels, Local and Long Distance Telephones, 4 Printing and Newspaper Offices, 12 Churches, Armouries, Theatre, Public Library, Y. M. C. A., Gas Plant, and a 52-roomed Hospital.

BARRIE has an excellent sewerage system, and is a very healthy town to live in. Hay fever is entirely unknown.

BARRIE is beautifully situated and has natural scenery in abundance. Is the mecca for tourists, and often termed "The Venice of America." Kempenfeldt Bay affords good boating, fishing and bathing.

BARRIE is the home of the Barrie Tannery, Barrie Carriage Works, Canada Producer and Gas Engine Co., Barrie Planing Mill, The Bell Planing Mill Co., and other industries.

BARRIE has many advantages for manufacturers of Woodenware, Knitting Mills, Tanneries, Shoe Factories, Wool Factories, etc., and has a number of excellent factory sites at a very low figure.

BARRIE has plenty of labour, both skilled and unskilled.

BARRIE is surrounded by a magnificent farming country and has a good market for live stock, produce, grain, etc.

BARRIE'S boat service connecting with Orillia and other towns and resorts on Lake Simcoe is good and improving yearly, and is greatly appreciated by summer tourists. It has within a few miles unlimited lake shore front suitable for summer cottages and summer residences.

BARRIE Citizens' Band is a first class organization and gives free concerts weekly throughout the summer months.

ORGANIZATIONS AND SOCIETIES.—Barrie Bowling and Tennis Club, Barrie Horticultural and Town Improvement Society, Barrie Aquatic Club.

BARRIE SPORTS.—Swimming, Boating, Fishing, Bowling, Tennis, Golf, Ball, Lacrosse, Driving, Motoring, etc.

Fenelon Falls, Ontario

To the thousands of campers, tourists, owners of power yachts, from both Canada and the United States who annually spend their summer vacation on the beautiful chain of lakes between Balsam and Cameron Lakes, constituting the Trent Canal, no summer resort is more favorably known than Fenelon Falls, Ont. This charmingly situated little town is practically a key to one of the most beautiful sections of the Kawartha Lakes. To the tourist who depends upon his canoe or paddle to convey himself and his summer outfit from point to point, no more admirably situated and picturesque location could be selected. The everlasting roar of falling water soothes the senses of the man who, in town or city, has his nerves upset by the strenuous competition of modern life. The Fenelon River placidly flowing past the hotel at which he may stop, with its tree-crowned banks, where vegetation seems to defy nature by springing from cracks and crevices in the massive granite, teems with game fish. In the shadow of the granite banks lurk muskalonge and black bass only waiting for the spoon of the troller or the bait of the skilful fisherman. Within a few hundred feet of the admirably conducted and well provided hotels of Fenelon Falls is one of the best fishing grounds, if waters may be so described, to be found in our grand Dominion. Fenelon Falls can boast of having some of the finest and best managed hotels in Ontario.

The drinking water of Fenelon Falls is exceptionally pure and good. From Fenelon Falls the owners of gasoline and steam launches can readily ply to all parts of the Trent Canal system. The summer visitor thus has magnificent boating, fishing and bathing within a few feet of his hotel. The public steamboat service is unsurpassed. Fenelon Falls is within easy reach of Lindsay, Peterboro and Toronto by rail.

Manufacturers seeking locations where cheap power and transportation are a material factor should keep Fenelon Falls in mind. Electric power is here to be had for $10.00 per horse power. The Town Council and Board of Trade of Fenelon Falls, both active and progressive municipal bodies, offer suitable locating manufacturers free building sites and exemption from taxation should such locating factories employ a reasonable number of hands. Full information along such lines will be fully, freely and cheerfully supplied on application by the Secretary of the Board of Trade, Fenelon Falls, Ont. Fenelon Falls is *THE* place to spend your summer vacation if you want Health, Happiness, Good Bathing, Good Boating and Good Bass Fishing.

The Electric City—Peterborough

A MOST interesting point on the Trent Waterway is the City of Peterborough, with a population of 18,000. It is the only City on the Waterway and is one of the most prosperous, progressive and attractive places in the Dominion. The growth of the City, especially in the last few years, has been rapid, owing to the industrial development that has taken place, and in attractiveness and beauty it has kept pace with its expansion and increase of population. The basis of the growth of Peterborough is the fact that it has all the essentials and accessories for manufacturing and distributing, and in this respect it has advantages that are not excelled anywhere. The essentials for a manufacturing centre are:

Cheap electric power, and plenty of it.
Shipping facilities for reaching all markets.
Suitable sites for industries.
And good labour conditions.

Of Electric power, developed from the water powers on the Otonabee River and other waters, Peterborough has an abundant supply. Several of these power sites have been developed, and others are being developed, and as fast as it may be called for, 30,000 horse power of hydro-electric power can be supplied. This abundant supply of power is furnished, delivered to the user for power purposes at very low rates—so low as to be most attractive to manufacturers.

The shipping facilities are unexcelled. The City is situated between the two commercial centres, Montreal and Toronto, and is on the line from the Georgian Bay (which means the Northwest) to the seaboard, and is in a central location for reaching all the best markets. It has both the Canadian Pacific and Grand Trunk Railways. The Grand Trunk branches out in four different directions from the city, and besides being on the main line of the Canadian Pacific Railway between Montreal and Toronto, it is also on the Canadian Pacific line to the Georgian Bay. It has thus direct connection with all parts of the Dominion. The Trent Waterway also gives water communication, as is described in this publication.

The number and diversity of the industries in Peterborough makes labour of all kinds easily obtainable, and labour troubles are unknown. The workmen are largely home-owners and interested in the welfare of the city. Owing to expenses being lower than in the larger centres, the cost of labour is lower, which is a great advantage to the manufacturer.

Possessing these essentials for manufacturing and distributing, Peterborough also has excellent systems of sewers and waterworks, electric street railway, several large and fine parks, handsome churches and public buildings, a number of well equipped public schools, Collegiate Institute and Provincial Normal School, first class mercantile establishments, three hospitals, theatres, a low rate of taxes, most efficient fire protection—all the conditions for business, health, comfort and pleasure.

The summer resorts adjacent to Peterborough are celebrated ones, including Stony Lake, with its picturesque Islands, Chemong Lake, with its beautiful park, and the Otonabee River and Rice Lake, with their numerous attractive resorts.

These advantages of situation given by nature, and the acquired advantages that have been secured and built up, combined with the public spirit of the citizens, have resulted in Peterborough passing all the other towns in the district in the race for advancement. Its manufacturing industries are numerous, including The Canadian General Electric Company's works, in which about 2000 employees are engaged; The Quaker Oats Mills; The Brinton Carpet Factory, whose parent industry is in England; and woollen mills, lock factory, tool factories, makers of mill, mining and hydraulic machinery, agricultural implements, locks and builders' hardware, harness and saddlery, canoes, boats of all kinds, sails and tents, rope and cordage, gasoline engines, lumber, brick, furniture, cereal products, steam engines and pumps, show cases, mattresses, pork products, and many other lines. Altogether there is $12,190,000 of capital invested in manufacturing in Peterborough, and the annual production of the industries aggregates $42,000,000. Frequent enlargements are emphatic evidences of the prosperity of the industries. Wholesale houses, of which there are several, testify to the city's advantages as a distributing centre.

The many superior advantages of Peterborough are open to new industries, and enquiries will be willingly answered and information cheerfully given, and every effort will be made to facilitate their establishment. For additional intelligence on any point, or for specific information bearing on any line of manufacture, write to the City Clerk, and prompt attention will be given.

Trenton

BESIDES being the southern outlet of the Trent Canal, Trenton is conspicuous for its many natural advantages. For many years the citizens of Trenton have looked forward to the development of the water power on the Trent River. In a small way the Trenton Electric and Water Company have for a number of years developed a limited quantity of power at the Town timber dam, while the Gilmour Door Company also developed sufficient power at the same dam for their own use.

During the last couple of years the Electric Power Company has secured the practical control of all the powers on the River from Healey's Falls to Trenton, and it is estimated that their total development will exceed 100,000 horse power. This Company, with its network of transmission wires, has covered the Central Ontario district thoroughly and has acquired many of the local lighting and power plants in the towns and villages between Oshawa and Kingston.

Last January an excellent Council was elected, and as a result of their efforts and with the assistance of an energetic Board of Trade, Trenton has advanced faster commercially than ever before. The Council and Board of Trade of 1911 will long be remembered as having assisted most materially in bringing Trenton's advantages before the people of Canada and the United States.

Cheap power has, of course, been the magnet which has attracted many of the new industries to Trenton. Power at $15.00 per H. P. twenty-four hours' service, delivered at the customer's terminals, is certainly a drawing card. The Town of Trenton has at this rate 1000 H. P. to dispose of, having, in return for a lease of its power rights at Dams 1 and 2 to the Electric Power Company, accepted this amount of power as part of the settlement. The Trenton Electric and Water Company has now available for Trenton users 10,000 horse power, and upon the completion of Dam No. 2 will have to dispose of 20,000 H. P.

Of all the towns along the Canal, Trenton promises the greatest development, because it has the added advantage of being on the deep waters of Lake Ontario, and being served by more railways than any other town in Ontario. Trenton can offer great facilities for shipping by rail. It is the junction of the Grand Trunk and the Central Ontario Railways. This latter road is part of the Canadian Northern Ontario System, lately acquired, and Canadian Northern trains will be running through Trenton in July of this year. The Canadian Pacific lake shore line, now being surveyed between Toronto and Montreal, will run through Trenton. The proposed electric road between Toronto and Montreal will also traverse Trenton.

With easy access via the Murray Canal to Lake Ontario, Trenton has superior advantages as a distributing centre by water. The Richelieu & Ontario Navigation Company's Steamer "Belleville" calls regularly twice each week when on her run between Toronto and Montreal, while the large and handsome steamer of the Ontario & Quebec Navigation Company, "Alexandria," running between Rochester and Quebec, makes the same number of calls at Trenton. The "Geronia," the handsome new boat just launched at Collingwood, will also ply on this route. The steamers "Varuna" and "Brockville" make daily trips between Trenton and Picton, calling at Belleville and Deseronto. In addition to the passenger and package freight business catered to by these boats, many large freighters call at Trenton, carrying chiefly coal cargoes.

In addition to being a manufacturing town of importance, Trenton is fast coming under the notice of the people of Canada as a tourist centre. Where can you find a more beautiful spot for the summer campers and cottagers than the shores which skirt the Trenton harbour? The land locked water stretch is always comparatively calm. The turbulent waves from the lake do not ruffle its surface. How many would avoid the fatiguing crush of an Atlantic watering place if this ideal condition were brought to their notice with one tenth the persistency which the United States displays in keeping their places before the public. If the other transportation companies who are especially interested in this district would do as much to make its advantages known as the Ontario & Quebec Navigation Company has done, many more would come here every year.

It is fully expected that in less than two years it will be possible for small boats to ascend the Canal as far as Washago on Lake Couchiching, above Orillia. To anyone acquainted with the beautiful scenery along the banks of the River Trent, the prospect of taking this trip in a comfortable motor boat will be most alluring. Probably the finest black bass and pickerel fishing in Ontario is to be had in the waters of the Bay of Quinte and the River Trent.

Sports of every kind, having in view the physical development of the young men of the town, are freely indulged in and encouraged liberally. The boys and girls who grow up in Trenton will always look back to the days of their childhood with intense pleasure. No inland town for them!

Electric Motive Power for Eastern and Central Ontario

THE most pronounced feature co-incident with the opening up of the Trent Valley Canal, and closely allied with its engineering aspects, is apparent in the recent rapid development of the abundant water powers of the basin which the Canal traverses for three-fourths of its length. Rising in the remotest parts of the Highlands of Ontario, the Trent waters are collected by half a dozen important tributaries and poured subsidiarily into the long chain of Kawartha Lakes, covering approximately an area of 75 000 acres, and whose mean elevation above Lake Ontario is 550 feet.

From this large reservoir the water drops in a succession of falls varying from 10 to 75 ft in height, and scattered uniformly along the river's course to its outlet at Trenton.

From these water falls about 100 000 H P is being made available on water wheel shafts and 75 000 H P delivered at the industrial centres as electric energy.

The economical generation, control and distribution to points of demand of this very large quantity of power by the various original individual proprietary interests was manifestly impossible. As a consequence the exigencies of the situation evolved a single comprehensive system whose modern and standardized hydro-electric stations dot the map from Burleigh Falls to Trenton.

Connecting and radiating from the generating centres, a net work of carefully planned transmission lines covers the whole of Central Ontario from Peterborough at the north to Kingston on the east, and Whitby on the west, over which the power is distributed.

This organization of power interests is known as THE ELECTRIC POWER COMPANY LIMITED, with head offices in Toronto. Its power distribution system is almost completed, and not only is every manufacturing centre in the Trent district benefiting by the cheap and abundant power thus brought to its doors, but there are few villages and rural centres which as yet remain to enjoy electric light and modern electrical conveniences. This organization is furthermore giving the application of electricity to agricultural purposes its close study, with a view of still further enlarging the scope of its market and making Central Ontario the most modern and well developed community, both industrially and agriculturally, in Canada.

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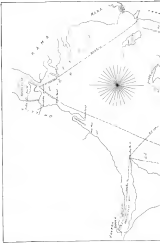
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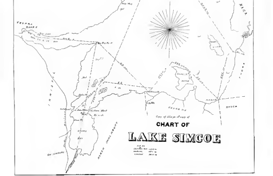
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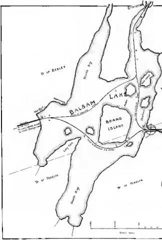
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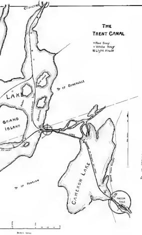
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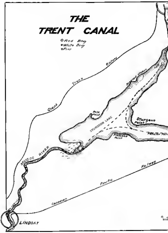
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Ball Point
STURGEON LAKE
Sturgeon Point
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SCUGOG RIVER
Canadian Pacific Railway
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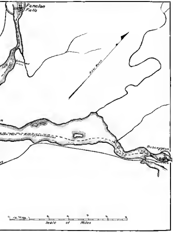
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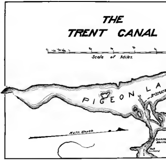
Scale of Miles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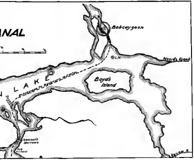
Oak Orchard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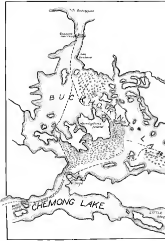
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Gannon's Narrows
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Harrington's Island
Indian Village
CHEMONG LAKE
LITTLE
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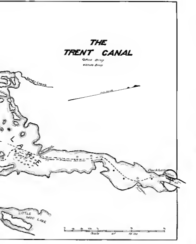
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Sandy Creek
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Buckhorn
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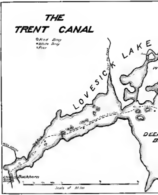
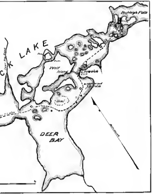
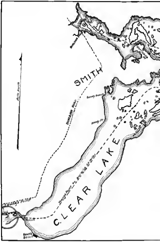
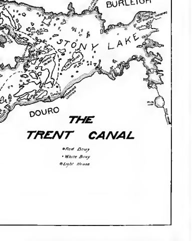
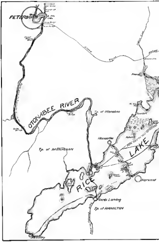
MUD LAKE
Scale of

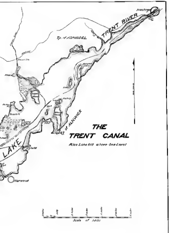

THE
TRENT CANAL
Red Bouy
White Bouy
Pier
Deer Bay Creek
LOVESICK LAKE
DEE
B
Buckhorn
Lock
Scale of Miles


Burleigh Falls
CK LAKE
Wolf Island
Lovesick
Lock
Dam
Shoal
DEER BAY

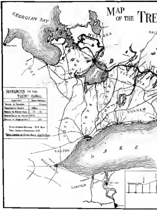

SMITH
Sandy Beach
Burleigh Road
Sandy Pt.
CLEAR LAKE
Young's Point
South Beach

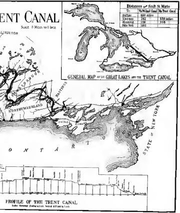

BURLEIGH
STONY LAKE
DOURO
THE TRENT CANAL
Red Bouy
White Bouy
Light House


PETERBO
OTONABEE RIVER
Grand
Trunk
Tp. of Otonabee
Hiawatha
Tp. of MONAGHAN
RICE
LAKE
Norwood
Gores Landing
Tp. of HAMILTON
Bewdley


Hastings
TRENT RIVER
Tp. of ASPHODEL
Tp. of ALNWICK
LAKE
Harwood
THE
TRENT CANAL
Rice Lake 613 above Sea Level
Scale of Miles

:   :   :

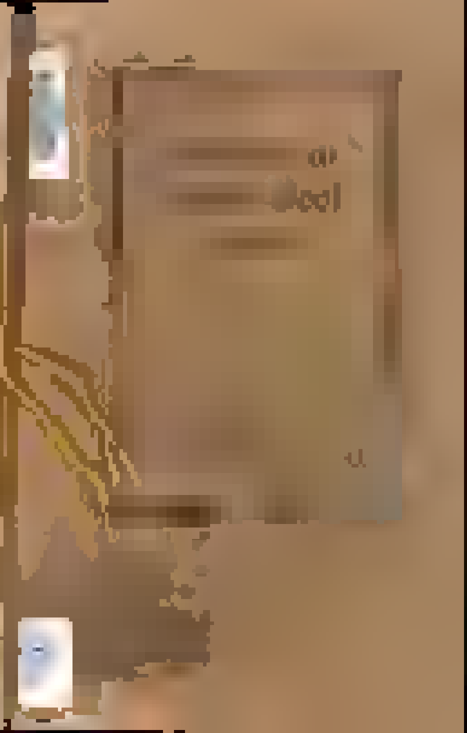

MAP OF THE TRE
GEORGIAN BAY
MUSKOKA
HALI
VICTORIA
YORK
DURHAM
HALTON
WENTWORTH
LINCOLN
L A K E
DISTANCES ON THE TRENT CANAL


ENT CANAL
SCALE 8 MILES TO 1 INCH
LIBURTON
HASTINGS
NORTHUMBERLAND
PRINCE EDWARD
O N T A R I O
STATE OF NEW YORK
GENERAL MAP OF THE GREAT LAKES AND THE TRENT CANAL
PROFILE OF THE TRENT CANAL

Distances from Sault St. Marie

To	Via Welland Canal	Via Trent Canal
Buffalo	600 miles	
Kingston	782	535 miles
Montreal	950	703
New York	1102	

FACULTY O ARCHITECTURE
LANDSC E AND DESIGN
LIBRARY
UNIVERSITY OF TORONTO
230 COLLEGE STREET
TORONTO ONTARIO M5T 1R2



[illegible]

O'Keefe's
PILSENER LAGER

SPECIAL EXTRA
O'Keefe's
MILD ALE

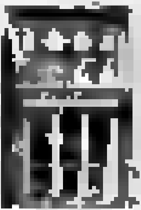
GRAND TRUNK [illegible] STORIES

[illegible]

The Royal Bank of Canada

[illegible]

[illegible]



PETERBOROUGH, [illegible]

[illegible]

THE STONEY LANE NAVIGATION

THE CANADIAN SAND BLAST CO.

[illegible]

[illegible]

[illegible]

[redacted]

[redacted]

[redacted]

[illegible] LINDSAY [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

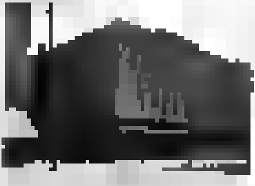
[illegible]

THE TOURISTS STORE

[illegible]

[illegible] LINDSAY

[illegible]



A Perfect Floor

[illegible]

[illegible]

Soclean

The New Varmed

[illegible]

[illegible]

GASOLINE
MOTORS

[illegible]

[illegible]

MURRAY KAY LIMITED
Importers and Retailers

[illegible]

DRY GOODS [illegible]

FURNISHING [illegible]

TORONTO [illegible]

[illegible]

THE
TRENT CANAL

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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[illegible]

[illegible]

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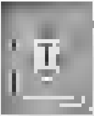

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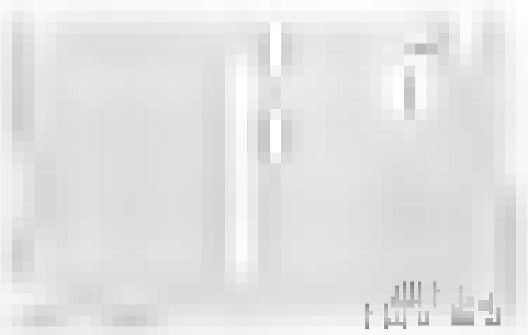

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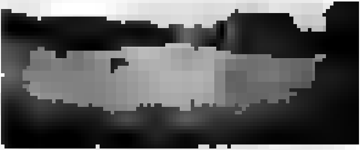
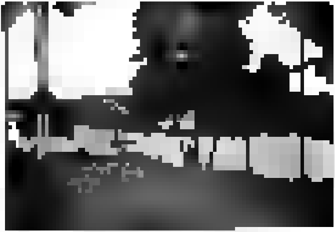
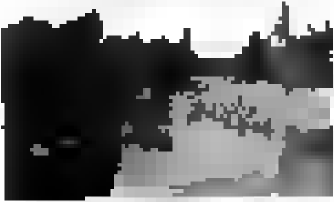


A [illegible] War in [illegible]

[illegible]





The Present State of Great

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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Social Hours

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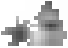
[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Bill of Sale

[illegible]

[illegible]

The Cost of Construction

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

The Lonely Shore and Tool Conquer

[illegible]

The Place for Hats

BARKER'S

[illegible]

The PETERBORO HARDWARE Co.

Builders' Supplies
and
General Hardware

[illegible] PHONE [illegible]

[illegible] Hotel

[illegible]

MITCHELL'S

[illegible] VAULTS

[illegible]

J. [illegible] MITCHELL

[illegible]

TO[illegible]K[illegible]S

[illegible]

SELECT FROM

[illegible]

[illegible]

[illegible]

[illegible]

H GIBB

[illegible]

[illegible]

[illegible]

[illegible]

THE KINGAN HARDWARE CO

[illegible]

Wholesale and Retail

Fishing Tackle

Sporting Goods

[illegible]

GENERAL HARDWARE

PETERBOROUGH ONTARIO

[illegible]

Campers and Tourists
On Kawartha Lakes

[illegible]

JUNIPER ISLAND STORE

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

JAMES H. BELL

[illegible]

[illegible]

[illegible] Goods and Campers' Tools

TWO STORES [illegible]

[illegible] Canada's

[illegible]

[illegible]

[illegible]

Park

[illegible]

Independence Road [illegible]

[illegible]

[illegible]

DRINK HABIT

THE GATLIN

[illegible]

GATLIN INSTITUTE

[illegible] JARVIS STREET, TORONTO, ONT

C. W. CABLEY [illegible]

[illegible]

[illegible]

S. A. OKE

[illegible]

[illegible]

[illegible]

[illegible] Livery and Boarding Stable

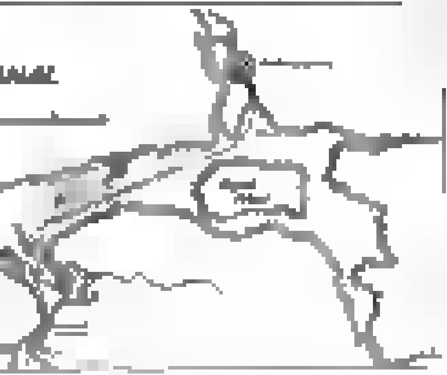
[illegible]

[illegible]

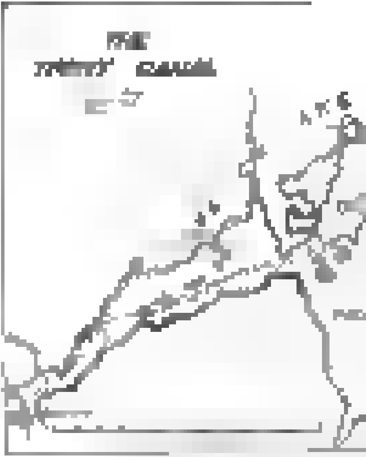
[illegible]

THE
[illegible] CANAL

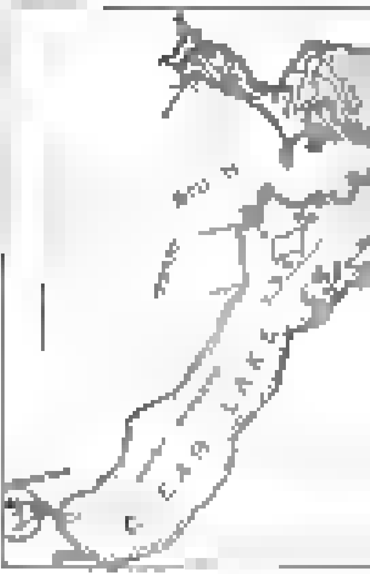
THE
TRENT CANAL



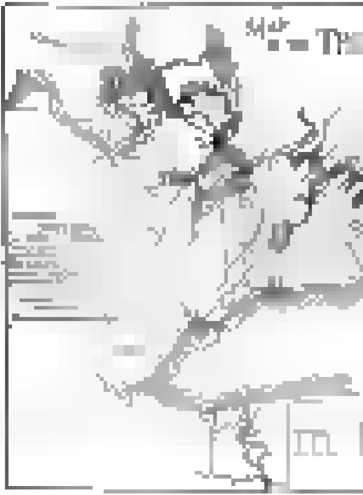
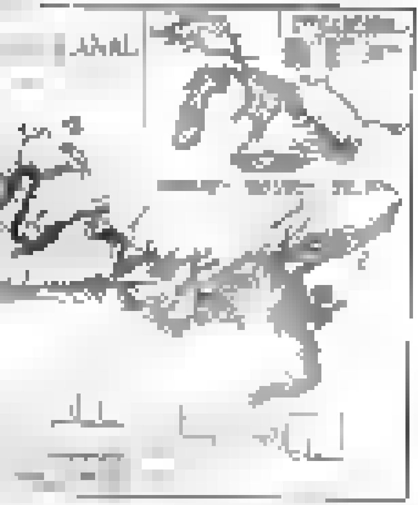
LAKE



THE
CANAL


CAYUGA LAKE

THE TRENT CANAL

[illegible]
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